
Land saving targets in Alpine countries and regions

***Contribution to IP_SP1_3
of the Alpine Climate Target System***

**Spatial Planning and Sustainable Development Working Group of
the Alpine Convention**

Mandate 2021-2022



ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

IMPRINT

This report is the result of the Spatial Planning and Sustainable Development Working Group of the Alpine Convention mandate chaired by Germany [.

The members of the Working Group are:

President: Dr. Daniel Meltzian (*Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen* – German Federal Ministry for Housing, Urban Development and Building)

Supported by: Stefan Marzelli, Florian Lintzmeyer (*ifuplan Institut für Umweltplanung und Raumentwicklung* – Institute for Environmental Planning and Spatial Development), Prof. Dr. Tobias Chilla (*Friedrich-Alexander-Universität Erlangen-Nürnberg* – Friedrich-Alexander University Erlangen-Nuremberg)

National delegates:

- **Austria:** Michael Roth, Katharina Zwettler (*Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie* - Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology), Daria Sprenger (*Land Tirol* – Province of Tyrol)
- **France:** Sylvie Vigneron (*Commissariat de massif des Alpes* - Commissariat de Massif Alpes)
- **Germany:** Lukas Kühne (*Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen* - Federal Ministry for Housing, Urban Development and Building), Clara Hoffmann (*Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie* - Bavarian State Ministry for Economic Affairs, Regional Development and Energy)
- **Italy:** Michele Munafò (*Istituto Superiore per la Protezione e la Ricerca Ambientale* - Italian Institute for Environmental Protection and Research), Andrea Omizzolo (*Eurac Research*), Luisa Pedrazzini (*Regione Lombardia* - Lombardy Region), Chantal Treves (*Regione Valle d'Aosta* - Aosta Valley Region)
- **Liechtenstein:** Alexandra Kreyden (*Liechtensteinische Landesverwaltung* - Liechtenstein National Administration)
- **Monaco:** Astrid Claudel-Rusin (*Gouvernement Princier de Monaco* - Government of Monaco)
- **Slovenia:** Lenča Humerca Šolar (*Ministrstvo za okolje in prostor* - Ministry of the Environment and Spatial Planning)
- **Switzerland:** Marc Pfister (*Bundesamt für Raumentwicklung ARE* - Federal Office for Spatial Development ARE)

Observers: Elena Di Bella (*EUROMONTANA European association of mountain areas*), Maria Schachinger (*World Wide Fund For Nature*), Mimi Urbanc (*Slovenska akademija znanosti in umetnosti* - Slovenian Academy of Sciences and Arts), Guido Plassmann (*Netzwerk Alpin*

Schutzgebiete - Alpine Network of Protected Areas), Paul Kuncio (*CIPRA Commission Internationale pour la Protection des Alpes* - International Commission for the Protection of the Alps), Miro Kristan (*IP Tolmin*), Steffen Reich (*Club Arc Alpin*)

Permanent Secretariat of the Alpine Convention: Živa Novljan

Authors: Florian Lintzmeyer, Claudia Schwarz (*ifuplan Institut für Umweltplanung und Raumentwicklung* – Institute for Environmental Planning and Spatial Development)



Permanent Secretariat of the Alpine Convention, [month YEAR]

Herzog-Friedrich-Straße 15
A-6020 Innsbruck
Austria

BRANCH OFFICE
Viale Druso/Drususallee 1
I-39100 Bolzano/Bozen
Italy

info@alpconv.org

TABLE OF CONTENTS

1. EUROPEAN POLICY FRAMEWORK.....	1
2. LAND SAVING TARGETS IN ALPINE COUNTRIES.....	1
2.1 Austria	2
2.2 France	3
2.2.1 Region Auvergne-Rhône-Alpes (AuRA).....	7
2.2.2 Region Provence-Alpes-Côte d'Azur (PACA)	8
2.3 Germany.....	9
2.3.1 Bavaria.....	10
2.4 Italy	11
2.4.1 Lombardy	12
2.4.2 Piedmont	13
2.4.3 Veneto.....	14
2.4.4 Trentino – Alto Adige	16
2.5 Liechtenstein.....	17
2.6 Monaco.....	17
2.7 Slovenia.....	17
2.8 Switzerland	19
3. SUMMARY.....	23
BIBLIOGRAPHY.....	25

1. BACKGROUND

As a contribution to the Alpine Climate Target System, this survey represents Step 3 of the Spatial Planning Implementation Pathway 1 “Alpine wide concept “Spatial Planning for Climate Action”” in the form of a survey on land saving targets and challenges. The task was to assess which Alpine Convention states/countries have adopted land saving targets or are discussing them. The survey was supplemented with an overview of measures foreseen in the specific documents and the current land take in the Alpine countries and selected regions/federal states/provinces.

2. EUROPEAN POLICY FRAMEWORK

The policy objective to achieve zero net land take by 2050 has been adopted in the following European policy programmes and strategies (Table 1).

Table 1: European policy framework on net zero land take 2050

Document	Adopted by	Date	Reference
Roadmap to a Resource Efficient Europe (COM (2011) 571 final)	European Commission	2011	<i>“By 2020, EU policies take into account their direct and indirect impact on land use in the EU and globally, and the rate of land take is on track with an aim to achieve nonet land take by 2050”</i>
Environment Action Programme to 2020 (7 th Environment Action Programme EAP)	European Parliament and Council	2013	<i>“Environmental considerations [...] should be integrated into planning decisions relating to land use so that they are made more sustainable, with a view [...] towards the objective of ‘no net land take’, by 2050.”</i>
EU Soil Strategy for 2030 (COM (2021) 699 final)	European Commission	2021	<i>“The EU should achieve no net land take by 2050, which will contribute to the net removals target of 2030. To do so, notably Member States should set by 2023 their own ambitious national, regional and local targets to reduce net land take by 2030 in order to make a measurable contribution to the EU target of 2050, and report on progress.”</i>

Over the recent years, this European target has been adopted by most Alpine countries as a long-term perspective in addition to their individual medium-term land saving targets.

3. LAND SAVING TARGETS IN ALPINE COUNTRIES

In 2020, the Alpine Convention Soil Protection Working Group has produced an overview of land-saving targets adopted by the Alpine states or regions (Alpine Convention 2020, see Figure 1). In the meantime, the following targets (red boxes) have been added or inserted to amend the existing targets.

Target		Timeframe	Recent additions
Alpine Convention	-	-	
Austria	2,5 ha/day (intentional target of Federal Government)	2030	
Germany	30 ha/day	2030	Net zero 2050
Bavaria	5 ha/day as benchmark	2030	Land use circular economy (undefined)
France	zero net artificialisation of soils	2050	50% reduction > 10 years (not yet passed)
Auvergne – Rhone Alps			50% reduction by 2027, net zero by 2040
Provence-Alpes-Côte d'Azur			~ 1 ha/day by 2030
Italy			
Lombardy	25% reduction of the forecast of land consumption from 2014	2020	Net zero 2050
	45% reduction	2025	
Piedmont	Max. 3% of existing urbanized area each 5 years	-	Net zero (undefined timeline)
Veneto	40% reduction of the forecast of land consumption	Since 2011	Net zero 2050
Liechtenstein	-	-	
Slovenia	Reduction of net growth of built-up land for 25%	2030	
	Zero net growth of built-up land	2050	
Switzerland	Net zero land take	2050	Land take reduction by 1/3 (2020-2030)
European Union	No net land take	2050	National/regional/local targets by 2023
United Nations	Land Degradation Neutrality	2030	

Source: Alpine Convention, 2020, modified.

Figure 1: Overview of land saving targets in Alpine countries and regions

2.1 Austria

Target	2.5 ha/day respectively 9 km ² /year (Federal Government) until 2030 Target path to reduce land consumption to a net 2.5 ha/day by 2030 and compensate for additional soil sealing in the medium term by unsealing corresponding areas
Reference documents	Governmental programme 2020-2024 (Republik Österreich 2020:104), Austrian Strategy for Sustainable Development (NSTRAT) (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2002), Austrian Strategy for Sustainable Development (ÖSTRAT) (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2010), Austrian Spatial Development Concept 2030 (Österreichische Raumordnungskonferenz 2021), Austrian Soil Protection Strategy (to be elaborated in 2022), Austrian Masterplan for Rural Areas (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2017:39).
Current land take	11.5 ha/day for 2018-2020 (three years moving average, see Figure 2) ¹ , 10.7 ha in 2020
Measures outlined in reference documents	Soft measures, such as recommendations (ÖROK-Recommendations Nr. 56), information, good practices, capacity building, designation of high value agricultural land (e.g. Tyrol) and ecological priority sites, promotion and extension of brownfield development, (re)use of inner-urban potentials.

¹ <https://www.umweltbundesamt.at/umweltthemen/boden/flaecheninanspruchnahme>

	The ÖREK 2030 ² proposes the establishment of an ÖREK-partnership “2.5 ha” to elaborate recommendations for quantitative targets at Länder level and differentiated requirements for different spatial entities. ³
Method of quantification	Digital cadastral map ⁴

The 2.5 ha target was already envisaged in the 2002 Austrian Sustainability Strategy, to be reached by 2010. The 2.5 ha goal was reiterated in the Austrian Soil Strategy on October 10th 2021. At the province level, no land saving targets exist in Austria.

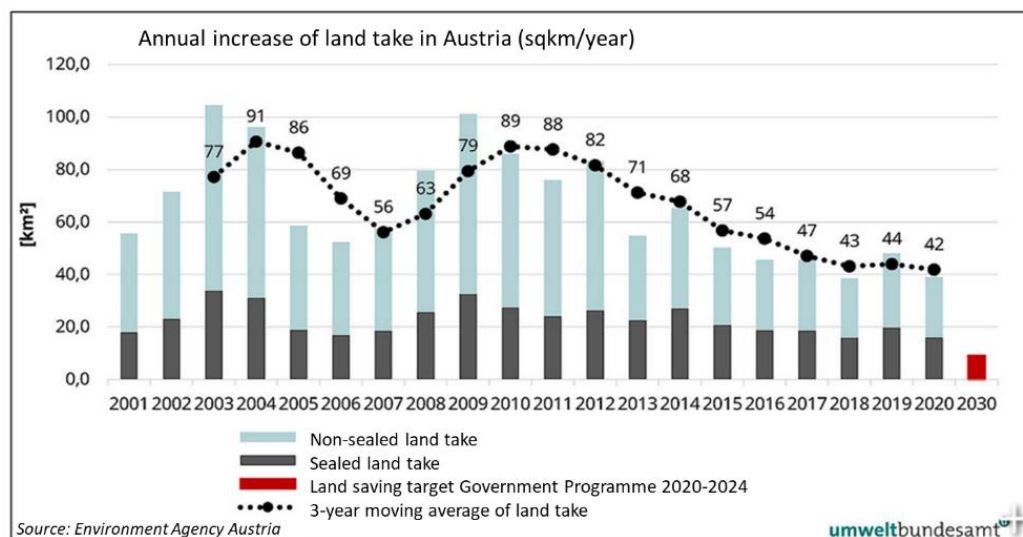


Figure 2: Annual increase in land take in Austria (km2/year)⁵.

2.2 France

Target	Zero net land take (ZAN=zéro artificialisation nette) by 2050 Half-reduction of land consumption within 10 years after the promulgation of the Climate and Resilience Law compared to the 10 years preceding that date (2021-2031, Climate and Resilience Law)
Reference documents	Biodiversity Plan 2018 (Plan National Biodiversité 2018 (Ministre de la Transition écologique 2018) “Climate and resilience law” passed August 22nd 2021 ⁶
Current land take	23,528 ha (total France incl. DOM) in 2020 (which corresponds to approx. to 54.8 ha/day ⁷) (see Figure 3))

² <https://www.oerek2030.at/>

³ For additional proposals, see <https://www.oerek2030.at/kapitel-6/ziel-2>

⁴ „The regional information of the land database (GDB) of the Federal Office of Metrology and Surveying. It provides land-related information on specific administrative units (e.g. federal state, district, municipality) and shows, among other things, areas according to types of use (e.g. building land, forest, bodies of water) and uses (e.g. greened building land, paved building land). The regional information is updated when necessary on the basis of changes in the GDB and the digital cadastral map. Due to the deep territorial division (cadastral municipality level), specific evaluations are also possible within the Alpine Convention perimeter.” (Umweltbundesamt 2017:39)

⁵ Source: <https://www.umweltbundesamt.at/umweltthemen/boden/flaecheninanspruchnahme>

⁶ LOI n° 2021-1104 du 22 août 2021 portant lutte contre le dérèglement climatique et renforcement de la résilience face à ses effets <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043956924?msclid=bdb65294c61611ec8ce8db2db18e0d5f>

⁷ <https://artificialisation.biodiversitetousvivants.fr/parution-des-donnees-dartificialisation-2009-2019>

Measures outlined in reference documents	• Strict application in urban planning: accurate assessment of new housing needs, priority given to reduction of vacant home, urban renewal, increased density, limitation of urban sprawl. The French Mountain Law (1985, 2018) introduced the principle of urbanisation in continuity. • Financial devices (promoting brownfield regeneration, revitalisation of city centers, ecoconditional aids (Plan Avenir Montagne)) • Soil artificialisation reports at (inter)municipal level are due every three years • Soft measures, such as recommendations, information, good practices, capacity building, e.g. Practical guide to limit land take (Guide pratique pour limiter l'artificialisation des sols) and toolboxes
Method of quantification	Observatory for soil artificialisation ⁸ (introduced in 2019)

The French Climate and Resilience Law includes a programmatic dimension, setting a Net Zero Artificialization objective in 2050 and a trajectory to achieve this goal (dividing land take by 2 in the 10 years following the law's promulgation, i.e. by 2031). According to Article 207, the government is expected to report every 5 years on the evaluation of the policy to limit land take, including recommendations on the trajectories in view of the 2050 net zero target and specifying orientations for the decade 2031-2040.

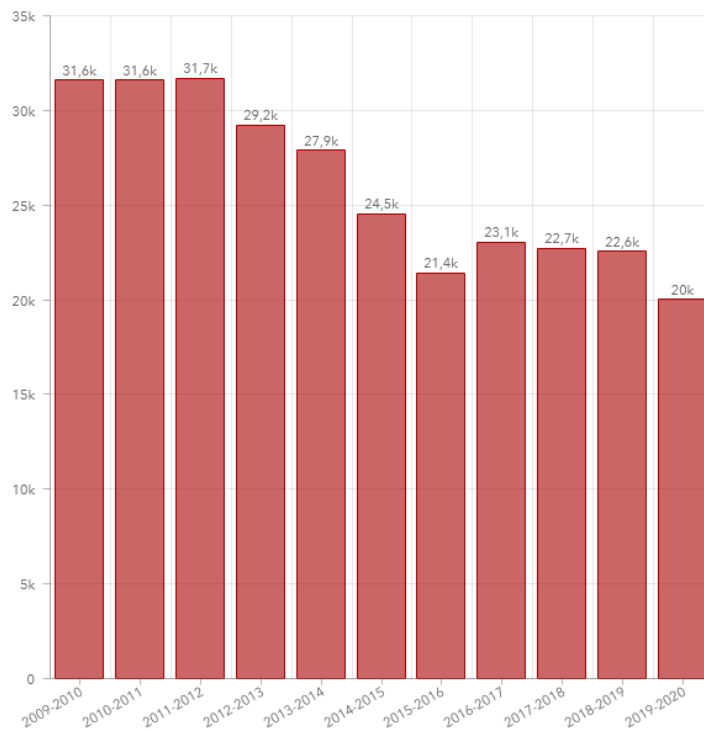
The target and trajectories have to be implemented at each territorial level :

- Regional Planning, Sustainable Development and Equality Scheme (SRADDET) by February 22 2024,
- Intraregional territorial cohesion schemes (SCOT) by 2026
- and Intercommunal Local Urban Plan (PLUi) by 2027

In view of the application of the new « Climate and Resilience Law » and as a basis for policy assessment, a national observatory for soil artificialisation (L'observatoire de l'artificialisation⁹) has been launched in 2019.

⁸ <https://artificialisation.biodiversitetousvivants.fr/>

⁹ <https://artificialisation.developpement-durable.gouv.fr/suivi-consommation-espaces-naf#paragraph--2164>



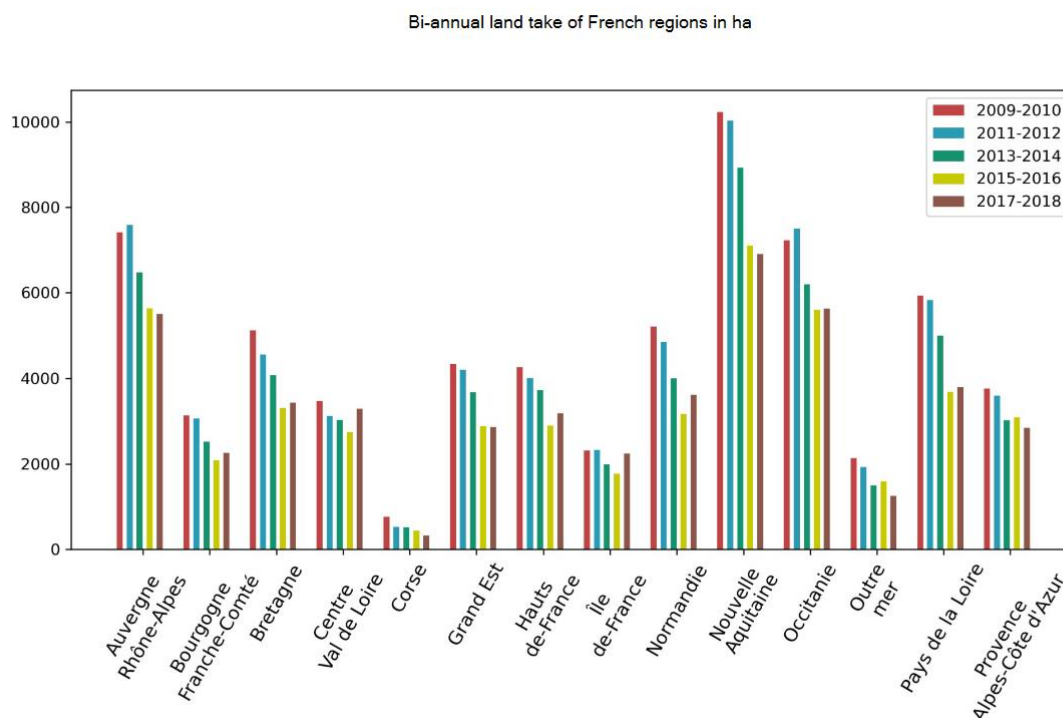
Source: CEREMA l'observatoire de l'artificialisation.

Figure 3: Land take in France (consumption of NAF 2009-2020 in ha)¹⁰

For the French regions (see Figure 4) covering parts of the Alpine Convention perimeter, the current land take is approximately 7.1 ha (Auvergne-Rhone Alpes¹¹) resp. 2.7 ha (Provence Alpes – Cote d'Azur) (Cerema Hauts-de-France 2020).

¹⁰ <https://kartes.cerema.fr/portal/apps/opsdashboard/index.html#/3feb8bd2b14d449eb03bb3f7fee9d849>

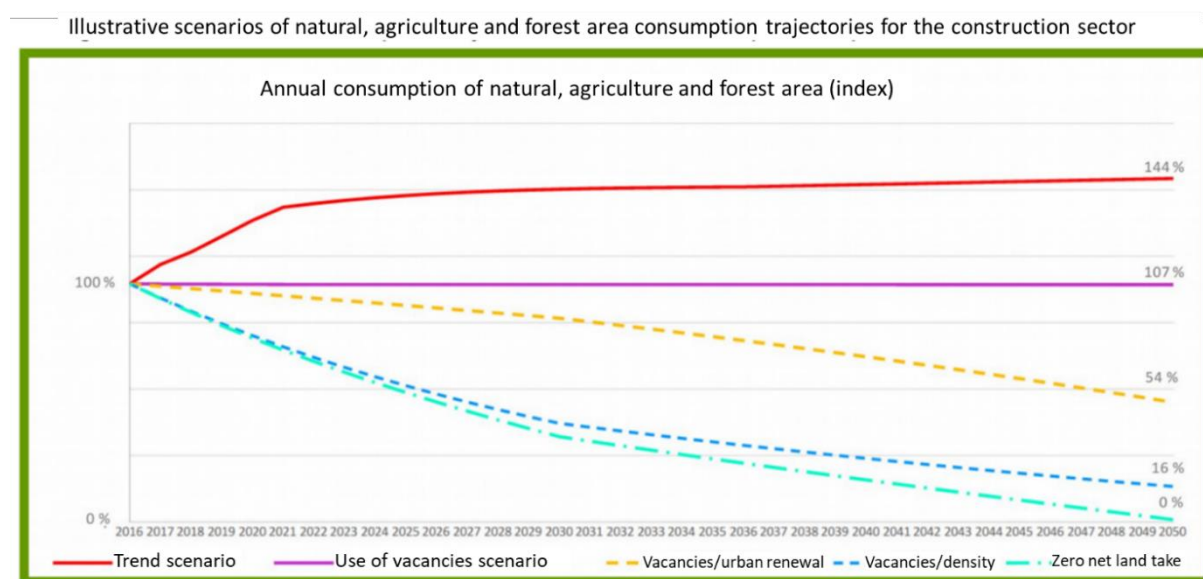
¹¹ Areas with high land take have been identified in this regional assessment: <https://www.cerema.fr/fr/centre-ressources/newsletters/signature/signature-69-artificialisation-sols-sa-mesure/znieff-i-artificialisation-sols-region-aura>



Source: Cerema Hauts-de-France, 2020b:26.

Figure 4: Land take in French regions (including AuRA, PACA)

The French Commissariat Général au Développement Durable (CGDD) has assessed different pathways towards the net zero target (see Figure 5) and concluded that only the ZAN-scenario, combining „reduction of vacancies“, „urban renewal“, „increased density“ and „rezoning“, is capable of achieving the zero net land take target (Commissariat Général au Développement Durable 2019).

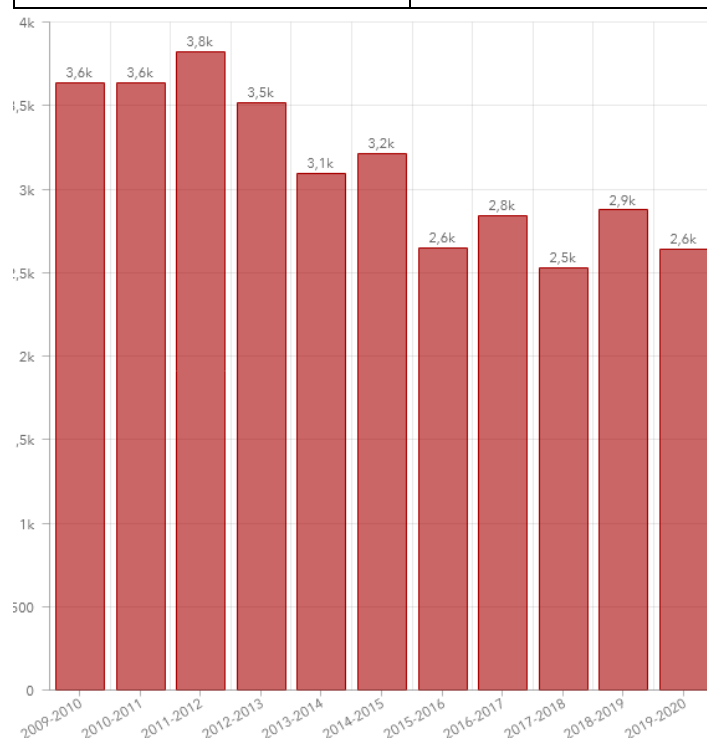


Source: Commissariat Général au Développement Durable, 2019:5.

Figure 5: Land take scenarios in regard to the French net zero target 2050

2.2.1 Region Auvergne-Rhône-Alpes (AuRA)

Target	Net zero land take (ZAN) in 2040 and half reduction of land take by 2027 compared to 2020
Reference document	La stratégie eau - air – sol en Auvergne-Rhône-Alpes (Prefet de la Region Auvergne-Rhone Alpes 2019, 2021)
Current land take	~7.1 ha (see Figure 6)
Measures outlined in reference documents	Stakeholder participation in regard to the zero net land take trajectories Activate financial resource for brownfield development and regeneration Promotion of land strategies and allocation of public lands to municipalities Guideline for renewable energy projects Mobilise tools for agricultural and forestry compensations



Source: CEREMA l'observatoire de l'artificialisation.

Figure 6: Annual land take in the Region Auvergne-Rhône-Alpes (2010-2020, ha)

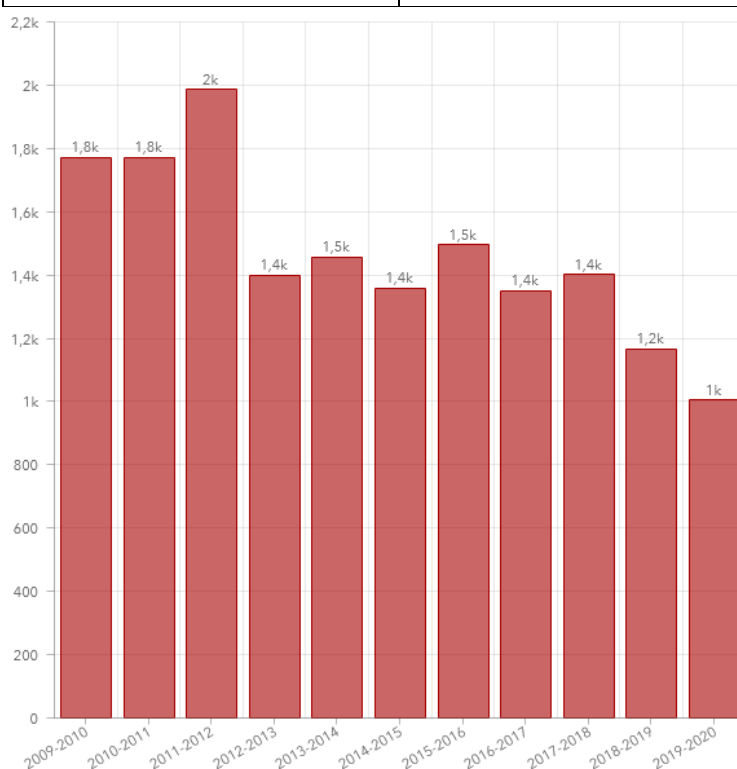
A first evaluation of the Water – Air – Soil – Strategy was published in 2021 (Prefet de la Region Auvergne-Rhone Alpes 2021). For Haute-Savoie, it reported a study commissioned by the Territorial Directorate¹² on water run-off depending on the level of soil sealing. The study proposes a method to identify plots suitable for unsealing. As a follow-up, it is planned to incorporate these results in future planning documents and concrete measures.

¹² <https://www.prefectures-regions.gouv.fr/auvergne-rhone-alpes/Region-et-institutions/L-action-de-l-Etat/Environnement-developpement-durable-et-prevention-des-risques/Eau-air-sol/Sur-le-terrain/Sur-le-terrain/Sol/>

The Auvergne-Rhône Alpes region has introduced the IDfriches programme¹³ to promote brownfield development and pilot regions on their trajectory towards net zero land take (“Objectif ZAN”, T-ZAN-Territories)¹⁴.

2.2.2 Region Provence-Alpes-Côte d'Azur (PACA)

Target	Half reduction of land take by 2030 compared to the average annual amount observed between 2006 and 2014.
Reference document	Schéma régional d'aménagement, de développement durable et d'égalité des territoires (SRADDET) de la Région SUD
Current land take	~3.9 ha / day on average (see Figure 7) 14,391 ha between 2010 and 2020.
Measures outlined in reference documents	Target -50% reduction of land take in local urban planning documents (“Schémas de cohérence territoriale”) Prioritize densification and renewal of existing urban areas and business zones to their extension Protect farming areas, especially if equipped by irrigation facilities Build waste treatment facilities or solar photovoltaic parks on brownfields whenever possible.



Source: CEREMA l'observatoire de l'artificialisation.

Figure 7: Annual land take in the Region Provence-Alpes-Côte d'Azur (2010-2020, ha)

¹³ <https://www.idfriches-auvergnerhonealpes.fr/presentation-didfriches>

¹⁴ <https://www.idfriches-auvergnerhonealpes.fr/actualite/ami-zan-vers-des-territoires-zero-artificialisation-nette-trajectoires-et-declinaison>

For the region Provence-Alpes-Côte d'Azur, a steeper decline in land take can be observed when compared to the region Auvergne-Rhône-Alpes (see **Fehler! Verweisquelle konnte nicht gefunden werden.**). In 2020, the daily land take amounted to 2.7 ha.

As for regional-level actions, the “Regional strategy for a more efficient land-use”¹⁵ lists the actions developed by the institution: funding, studies, engineering, partnerships, communications... Moreover, several measures of the regional “Plan Climat 2”¹⁶ promote reduction of land-take target and confirm those of the Schéma régional d'aménagement, de Développement durable et d'égalité des territoires (SRADDET)¹⁷.

This “Schéma” will be updated before 2024 to consider the latest French environmental legislation (loi “Climat et Résilience »), especially the territorialization of reduction of land-take targets at an infra-regional level. Concertation will be led with all concerned local actors.

In 2022, the PACA region has adopted a 2021-2024 Roadmap “Accompanying territories to reconcile development and land saving” (Prefet de la Région Provence-Alpes-Côte d'Azur 2022), launching 20 actions.

2.3 Germany

Target	30 ha/day minus X until 2030; net zero land take by 2050
Reference document	Sustainable development strategy (Deutsche Bundesregierung 2018) → 30 ha target Climate Protection Plan 2050 (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit 2016:68) → net zero target resp. circular land use economy 2050
Current land take	52 ha/day in 2019 (four-years moving average) ¹⁸
Measures outlined in reference documents	Soft measures, such as recommendations, information, good practices, capacity building, e.g. https://aktion-flaeche.de/
Method of quantification	Official Real Estate Cadastre Information System (Amtliches Liegenschaftskatasterinformationssystem ALKIS) which presents the current land use, e.g. agricultural land, which is already dedicated as building land is not registered as settlement/transport area.

The 30 ha target dates back to the 2001 version of the German Sustainability Strategy, to be reached by 2020. Once it became likely that the target will be missed, the timeframe has been extended by 10 years until 2030, adding the goal to undercut the target by an undefined measure, hence the “minus x”. In the Integrated Environmental Programme 2030, the German Environmental Ministry envisaged a stricter target of 20 ha by 2030 (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit 2016:82). On this target, however, there is no interministerial consensus at federal level in Germany.

¹⁵ <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/la-mise-en-oeuvre/les-guides-de-mise-en-oeuvre-du-sraddet/details-des-documents-ressources/fiche/strategie-regionale-pour-une-gestion-plus-efficiente-du-foncier-en-provence-alpes-cote-dazur/>

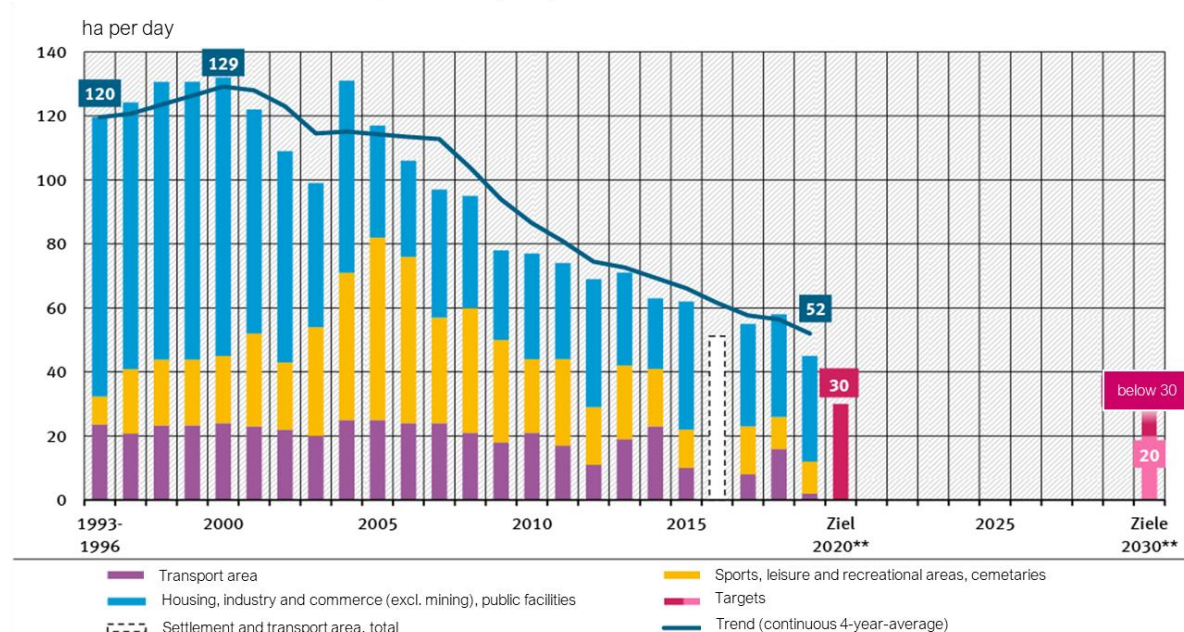
¹⁶ <https://www.maregionsud.fr/a-la-une/plan-climat-gardons-une-cop-davance>

¹⁷ <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/le-schema-regionale/>

¹⁸ <https://www.umweltbundesamt.de/daten/umweltindikatoren/indikator-siedlungs-verkehrsflaeche>

Figure 8 illustrates that while reducing land take significantly since the turn of the century, achieving the 2030 targets still poses a challenge for Germany.

Increase in settlement and transport area (SuV)



Source: German Environment Agency (modified), data: Federal Statistical Office.

Figure 8: Annual increase in land take in Germany since 1993

2.3.1 Bavaria

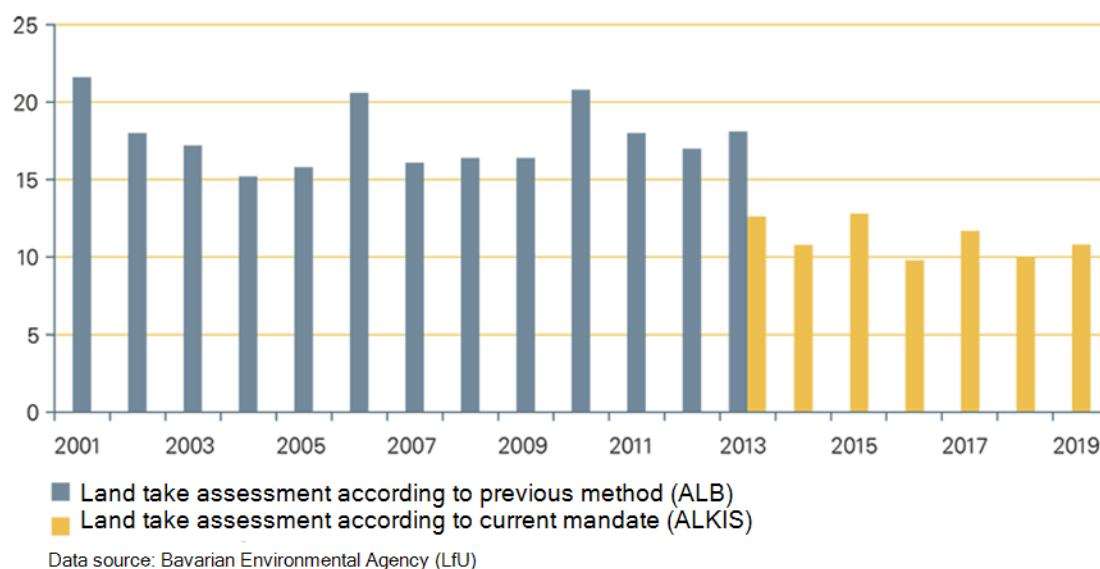
Benchmark	5 ha/day until 2030
Reference document	Bavarian State Planning Act (Bayerisches Landesplanungsgesetz BayLPIG) ¹⁹ , Art. 6 Principles
Current land take	11.6 ha/day in 2020
Measures outlined in reference documents	Recommendations, information, good practices, capacity building (land saving focal points at regional governments), but also legal implementation in the form of the revised Bavarian State Development Scheme (LEP) and the adoption of a 2030 benchmark in the Bavarian Spatial Planning Act. Activities are currently bundled in the Bavarian land saving campaign (Flächensparoffensive, Bayerische Staatsregierung 2020)
Method of quantification	Official Real Estate Cadastre Information System (Amtliches Liegenschaftskatasterinformationssystem ALKIS) merging real estate cadastral data of the digital cadastral map (DFK) and the automated land register (ALB), into one system and supplementing them by new data sets, such as the actual use, soil estimation, 3D building data, etc. The Bavarian land take statistic ("Amtliche Flächenstatistik") is based on ALKIS actual land use.

As implementation measure, all Bavarian municipalities are obliged by the State Government to carry out a demand assessment when zoning out new plots. This assessment is to be based

¹⁹ <https://www.verkuendung-bayern.de/gvbl/2020-675/>

on demographic development, structural spatial criteria, economic development dynamics, settlement structure development goals, and existing inner development potentials.²⁰

Unlike for Germany as a whole, land take remains at a high level in Bavaria, partly due to its economic dynamic and population growth (see Figure 9). The sudden drop in land take between 2013 and 2014 is due to a statistical recoding of land use, not to a factual sudden decrease in land take.



Source: https://www.lfu.bayern.de/umweltdaten/indikatoren/ressourcen_effizienz/flaechenverbrauch/index.htm

Figure 9: Land take in Bavaria

2.4 Italy

Target	At the national level, there is no land saving target for Italy. ²¹
Reference document	Sistema Nazionale per la Protezione dell'Ambiente 2021:19
Current land take	5,175 ha/year in 2020 ²² (which corresponds to approx. to 14.2 ha/day)
Method of quantification	Sentinel data / European Copernicus Program, Very High Resolution (VHR) satellite and aerial images and National map of land consumption produced by the National System for Environmental Protection (ISPRA, ARPA, APPA)

The WebGIS “Il consumo di suolo in Italia”²³, a product of Arpa Piemonte and ISPRA, is a very comprehensive tool to illustrate land take in Italy from the national, regional to the municipal level. The apparent decline in the increase of land take is due to the fact that the 2015 increase

²⁰ Interpretation guideline on demand assessment, see https://www.landesentwicklung-bayern.de/fileadmin/user_upload/landesentwicklung/Dokumente/Flaechensparoffensive/AuslegungshilfeBedarfsnachweis_Stan d092021.pdf

²¹ The introduction of a net zero land take by 2030 is currently being discussed in Italy (see Senato della Repubblica 2021:33), but not yet adopted.

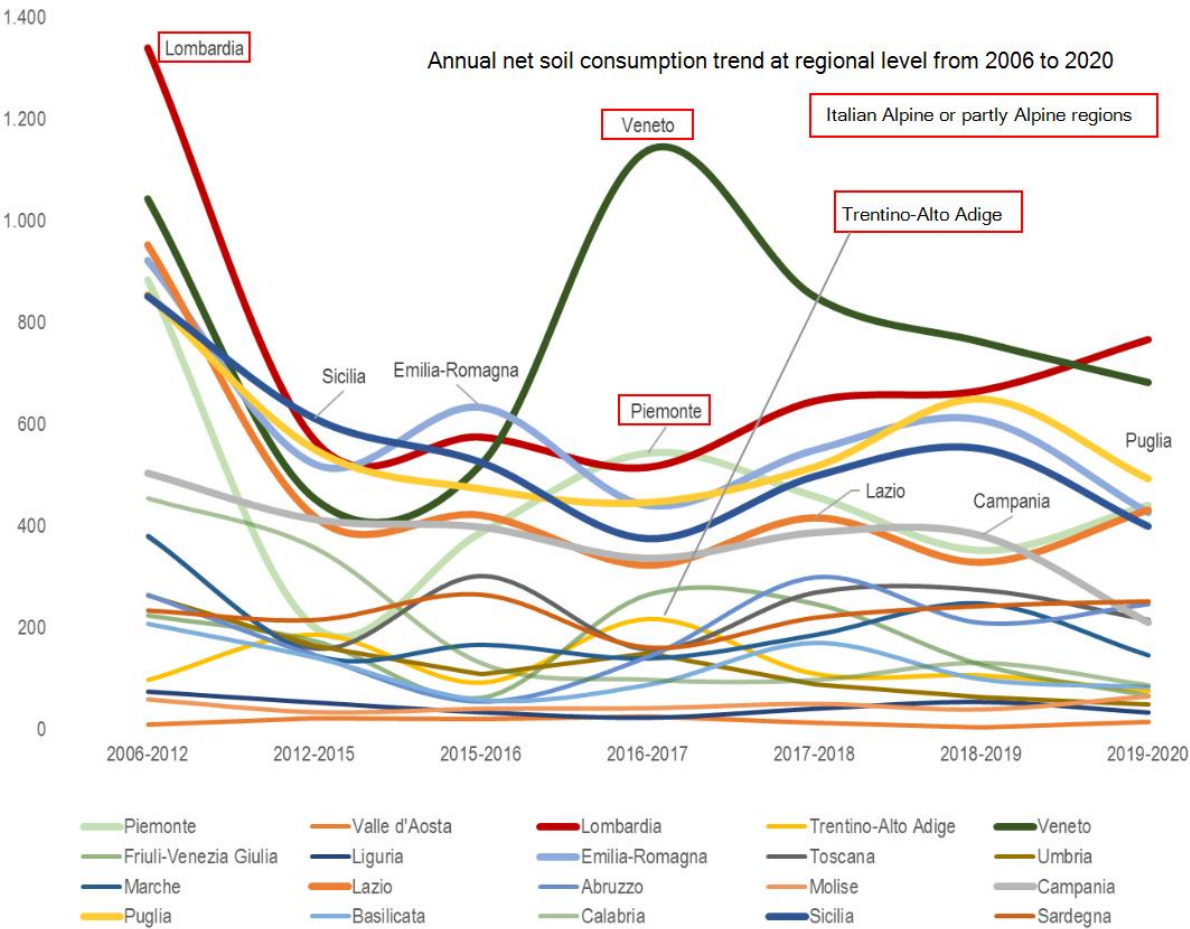
²² <https://www.isprambiente.gov.it/it/attivita/suolo-e-territorio/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo>

²³ https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4

encompasses the three-year period May 2012- May 2015 and the 2012 value the six-year period May 2006- May 2012. Italy adopts the definition of “artificial land cover” as a definition for “land take”, thus excluding green and vegetated surfaces in urban areas.

Over the last 15 years of observation, a reduction can be observed for some regions. However, there are also significant rebound effects e.g. for Veneto, Piedmont and to a smaller extent also Trentino-Alto Adige for the period 2026-2017 or for Lombardy over the most recent observation periods (see Source: Sistema Nazionale per la Protezione dell'Ambiente, 2021, with data from ISPRA/SNPA (modified).

Figure 10).



Source: Sistema Nazionale per la Protezione dell'Ambiente, 2021, with data from ISPRA/SNPA (modified).

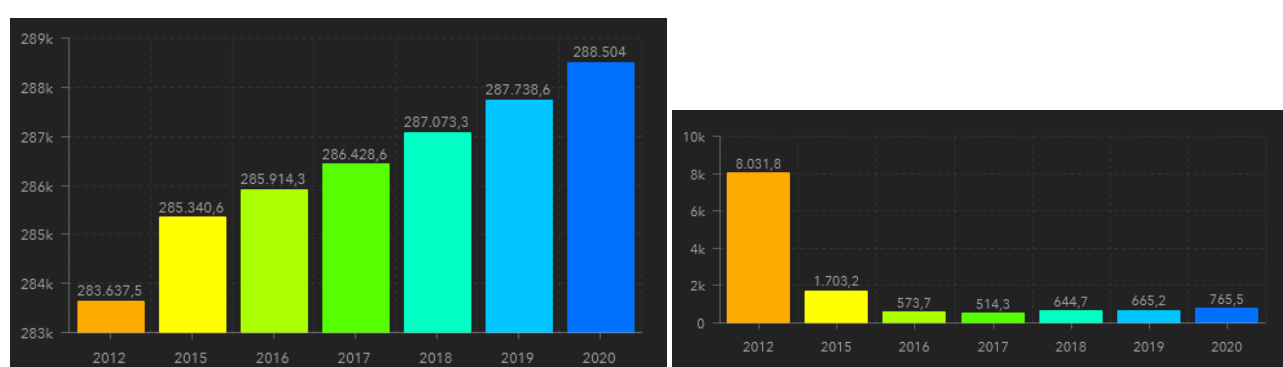
Figure 10: Land take in Italian regions (ha/year).

2.4.1 Lombardy

Target	25% reduction of the forecast of land consumption from 2014 until 2020, a 45% reduction until 2025 and net zero land take in 2050. The reduction targets refer to planned settlements in municipal plans in force since 2014. It should be applied according to the demographic trend, the quality of soils and the regeneration potential of each municipality and according to provincial and regional targets.
--------	---

Reference document	Regional law 31/2014 (legge regionale n. 31 del 28 novembre 2014 ²⁴): The law states that municipalities can no longer approve new forecasts of land take, while still being permitted to approve variations under the condition of “net zero”.
Current land take	765,45 ha/year (which corresponds to approx. to 2.1 ha/day) from 2019 to 2020 ²⁵ (Figure 11). The 2015 increase refers to the three-year period May 2012- May 2015 and the 2012 value refers to the six-year period May 2006 – May 2012.
Measures outlined in reference documents	Criteria for achieving objectives of urban renewal are laid down in the PTR. An ex-ante check of inner-urban development potentials needs to be conducted before zoning new land, incentives for retrofitting the existing building stock,

The land saving target has been integrated into the Regional Plan (Piano Territoriale Regionale, PTR) (Regione Lombardia, 2010, 2019) and provinces and municipalities are required to report land take data. The implementation process is described in Federici (2020).



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 11: Land take in Lombardy (surface area and annual increases 2012-2020 in ha)

2.4.2 Piedmont

Target	Max. 3% of existing urbanized area each 5 years ²⁶ , Net zero land take (currently undefined timeline), according to draft regional law Nr. 302 (pending) by 2040
Reference documents	Norme di attuazione Nr. 31, Soil protection in Regional Law 56/1977 ²⁷ , last amended in 2016 (PTR Piemonte) (Regione Piemonte 2011) The Regional Law Draft Nr. 302 Urban planning and environmental law provisions for containing land take, presented on June 5 th 2018 (Disegno di legge regionale n. 302 presentato il 05 giugno 2018 Norme urbanistiche e ambientali per il contenimento del consumo del suolo) envisaged the net zero land take to be reached by 2040. ²⁸

²⁴

http://normelombardia.consiglio.regione.lombardia.it/NormeLombardia/Accessibile/main.aspx?exp_coll=lr002014112800031&view=showdoc&iddoc=lr002014112800031&selnode=lr002014112800031

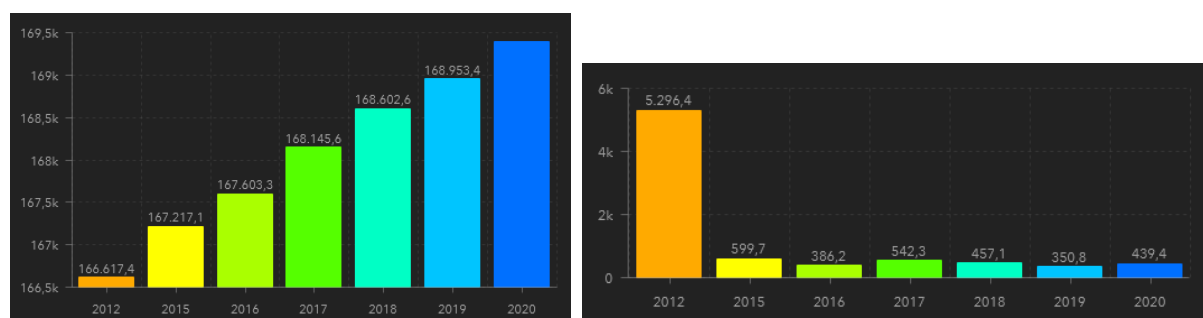
²⁵ <https://www.isprambiente.gov.it/it/attivita/suolo-e-territorio/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo>

²⁶ <http://relazione.ambiente.piemonte.it/2018/it/territorio/stato/suolo-consumo>

²⁷ <http://arianna.cr.piemonte.it/iterlegcoordweb/dettaglioLegge.do?urnLegge=urn:nir:regione.piemonte:legge:1977;56@2018-10-24&tornaIndietro=true>

²⁸ http://www.regione.piemonte.it/cgi-bin/ufstampa/comunicati/dettaglio_agenzia.cgi?id=19834

Current land take	439,4 ha/year in 2020 (which corresponds to approx. to 1.2 ha/day) (see Figure 12). The 2015 increase refers to the three-year period 2012-2014 and the 2012 value refers to the six-year period 2006-2011.
Additional remarks	With 169,392 ha total land take in 2020 (ISPRA), the 3% target translates to 5,081 ha new land take for every 5-year cycle, 1,016 ha every year resp. 2.78 ha per day for the Piedmont region.



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 12: Land take in Piedmont (surface area and annual increases 2012-2020 in ha).

2.4.3 Veneto

Target	40% reduction of the forecast of land consumption since 2011, Net zero land take 2050
Reference document	Decision Nr. 668 (dated May 15 th 2018), Art. 4 of the Regional Law Nr. 14/2017, Annex B of decision Nr. 668
Current land take	682 ha/year in 2020, corresponding to approx. to 1.9 ha/day. The 2015 increase (see Figure 13) refers to the three-year period May 2012 – May 2015 and the 2012 value refers to the six-year period May 2006 – May 2012.
Measures outlined in reference documents	Limitation of potential land take to 40% of land currently foreseen for urbanisation

With decision Nr. 668 (dated May 15th 2018), the Veneto Regional Government²⁹ approved the definition according to Art. 4 of the Regional Law Nr. 14/2017 on the maximum land take at regional level and its allocation at municipal and intermunicipal level (Alpine Convention 2020:24). This maximum value is defined as 40% (Annex B of decision Nr. 668) of the remaining potential urbanisation area, with corrections indicated for each municipality on an individual basis in regard to seismic classification, settlement pressure and ecological values. With this measure, the regional government is adopting important management and implementation tasks. Municipalities have reported 12,224 ha of land that are already transformed and an additional 21,323 ha that are - according to land use plans (strumenti urbanistici)- foreseen for residential or commercial purposes. Accordingly, the 40% share equals 8,530 ha – the maximum area still to be transformed until 2050, after which a net zero

²⁹ Contenimento del Consumo di Suolo – Regione del Veneto (<https://www.regione.veneto.it/web/ambiente-e-territorio/contenimento-consumo-di-suolo>)

target is foreseen. Distributed equally over the 32 years (2018-2050), this translates to 266 ha annual or 0.73 ha daily land take.

The document Allegato C DGR Nr. 668 (March 15th 2018) (Regione del Veneto 2018:4ff) provides a list of all Veneto municipalities with the respective values, resulting in a maximum amount of land consumption permitted for each individual municipality (Quantita massima di consumo di suolo ammesso). The random case of Agordo (see Table 2) illustrates the far-reaching implications of this regulatory framework. Situated in the Bellunese Alps, the municipality features a total land take (Superficie di suolo consumato, ISPRA 2021) of 145 ha. According to the new law, the maximum remaining land take until 2050 is 4.3 ha – 40% of the total 7.17 ha currently foreseen for development.

Table 2 Assessment of maximum residual land take at municipal level for the Veneto region

ASO	Codice ISTAT	Comune	Provincia	RESIDUO	CORRETTIVO INDICATORI PER A.S.O.			CORRETTIVO INDICATORI PER I COMUNI				
					RESIDUO RIDOTTO DEL 40%	percentuale dopo CORRETTIVO	RESIDUO DOPO CORRETTIVO	Variazione per classe sismica (2=-0,5%; 3=0%; 4=+0,5%)	Variazione per tensione abitativa (no=0%; si=-0,5%)	Variazione per varianti verdi (0,0001±0,05=-0,50%; 0,06±0,10=-1%; 0,11±0,14=-1,5%)	QUANTITA' MASSIMA DI CONSUMO DI SUOLO AMMESSO	Riferimento Tabelle Allegato D
				ha	ha	%	ha	%	%	%	ha	
26	28001	Abano Terme	Padova	76,57	45,94	90,00%	41,35	0,50%	0,50%	-1,50%	41,13	②
23	29001	Adria	Rovigo	83,77	50,26	100,00%	50,26	0,50%	0,00%	-0,50%	22,24	① ②
16	23001	Affi	Verona	7,95	4,77	75,35%	3,59	0,00%	0,00%	-0,50%	3,58	
21	28002	Agnà	Padova	27,73	16,64	92,13%	15,33	0,50%	0,00%	0,00%	15,41	
1	25001	Agordo	Belluno	7,17	4,30	100,00%	4,30	0,00%	0,00%	0,00%	4,30	
14	24001	Agugliaro	Vicenza	16,13	9,68	93,18%	9,02	0,50%	0,00%	0,00%	9,06	
4	25002	Alano di Piave	Belluno	6,61	3,97	95,39%	3,78	-0,50%	0,00%	-0,50%	3,75	

Source: Regione del Veneto 2018:4ff

Implementation at municipal level

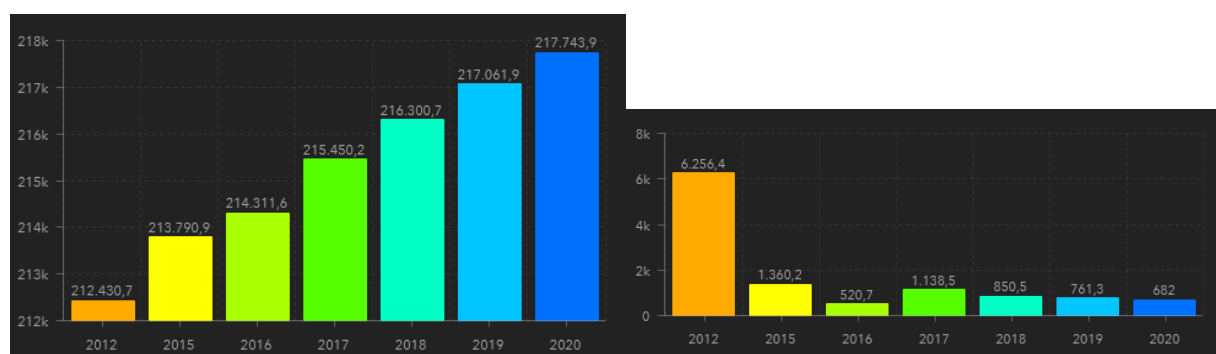
The maximum land take allocated by the Veneto region needs to be implemented in the municipal urban planning instruments. Before granting new permissions outside of consolidated urban areas, municipalities need to verify that they do not exceed this threshold. In any case, municipalities need to check beforehand if alternatives to taking up unbuilt land exist and need to report the result to the authorities approving zoning changes. Unsealing efforts are registered through an adaptation of total land balances.

Currently, 60% of municipalities (336 out of 563 Veneto region municipalities) have implemented their maximum land take in their respective urban planning instruments. Non-compliance leads to a moratorium of additional land take.

It is necessary to note that commercial development and logistics are not affected by these limitations. Nor does the Law Nr. 14/2017 apply to public infrastructures and buildings or those in the public interest.

The municipalities are legally obliged to adhere to the land take limits. However, for initiatives in the regional interest, municipalities can apply for additional permits from a “regional reserve” with regional authorities. The limited number of municipalities that have not enacted the

regional law 11/2004 “Norme per il governo del territorio e in materia di paesaggio”³⁰ (Rules for the government of the territory and in the field of landscape) by drafting a municipal structural plan (PAT, piano assetto comunale) are also eligible to draw land use permits from the regional reserve.

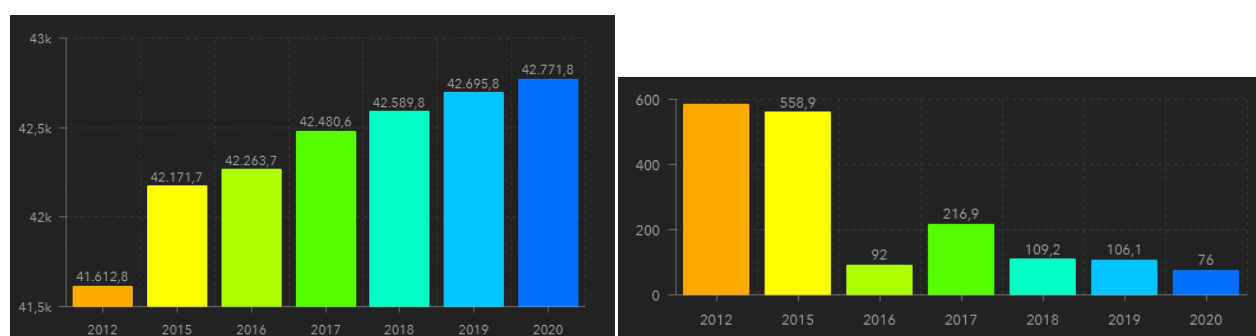


Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 13: Land take in Veneto (surface area and annual increases 2012-2020 in ha)

2.4.4 Trentino – Alto Adige

Target	No quantitative target, but delineation of urbanisation areas for 10-year periods
Reference document	Dekret des Landeshauptmanns vom 22. November 2018, Nr. 31 / Decreto del president della provincia del 22 novembre 2018, n. 31
Current land take	Trentino-Alto Adige: 75.97 ha land take from 2019 to 2020 (Sistema Nazionale per la Protezione dell'Ambiente 2021:64) resp. 0.21 ha per day. The 2015 increase (see Figure 14) refers to the three-year period May 2012 – May 2015 and the 2012 value refers to the six-year period May 2006 – May 2012. Between 2012-2017 daily increase of 0.24 ha of settled land.
Measures outlined in reference documents	Gemeindeentwicklungsprogramm / Programma di sviluppo comunale (Municipal development programme), which entails the following determinations: Delineation of settlement area Registration of vacant buildings (compulsory according to the new 2020 urbanisation law)



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 14: Land take in Trentino-Alto Adige (surface area and annual increases 2012-2020 in ha)

³⁰ https://cdn1.regione.veneto.it/alfstreaming-servlet/streamer/resourceId/b9a7fa19-a9a7-4ceb-9cc3-84367a1b2908/LR_11_2004

As an incentive for energetically retrofitting the housing stock, an “energy bonus” allows owners to exceed the permitted building mass by 20% and up to 200 m³ for existing buildings (Autonome Provinz Bozen-Südtirol / Provincia Autonoma di Bolzano - Alto Adige 2014). Eligible buildings must be built before 2005 and have to be improved from a lower KlimaHaus-category to at least category C.

2.5 Liechtenstein

According to the law on the protection and safeguarding of agriculturally usable soil (Gesetz vom 25. März 1992 über die Erhaltung und Sicherung des landwirtschaftlich nutzbaren Bodens, dated March 25th 1992)³¹, each municipality has to designate at least 30% of its total area as agricultural use zone.

2.6 Monaco

The Principality of Monaco is not pursuing a quantitative land saving target.

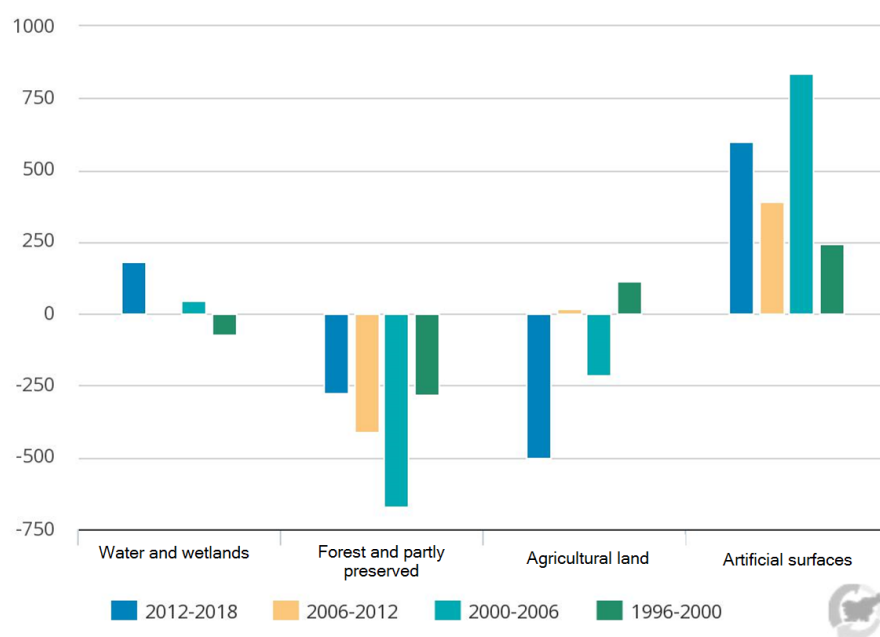
2.7 Slovenia

Target	Reduction of net growth of built-up land by 25% until 2030 (reference year and indicator will be defined by 2030) and zero net growth of built-up land until 2050
Reference document	The targets are stipulated in the Resolution on the National Environmental Protection Programme (Republic of Slovenia 2020).
Current land take	Between 2008-2012, 13,024 ha have been built-up, which equals a daily land take (rast površine pozidanih zemljišč or odvzem zemljišč) of 8.9 ha (Slovenian Environmental Report 2017 (Republic of Slovenia 2017), Alpine Convention 2020:24)
Measures outlined in reference documents	In chapter 5.2, the resolution (Republic of Slovenia 2020) outlines soil protection targets and policies and measures to accomplish them, including activation of urban brownfields, information and monitoring, legal framework, awareness raising and networking of stakeholders.

According to land use statistics, land use changes over the last 20 years have predominately taken place for urbanisation at the expense of mostly forests and agricultural areas, with a shift over the last observation period from forest areas to agricultural areas as “contributors” (see **Fehler! Verweisquelle konnte nicht gefunden werden.**). The official numbers for “urban residential sprawl” in Figure 15 respectively Table 3 appear to be very low (e.g. total land consumption of 33 ha for the time period 2012-2018) and might change in the course of improved data availability.

³¹

https://www.gesetze.li/konso/1992041000?search_text=landwirtschaftlich%20nutzbaren%20bodens&search_loc=text&lnr=&lglid_von=&observe_date=06.08.2021



Source: Slovenian Environmental Agency.

Figure 15 Land use changes (ha) for time periods in Slovenia

Table 3 Land use changes (ha) for time periods in Slovenia

	changes total[ha]	2012-2018[ha]	2006-2012[ha]	2000-2006[ha]	1996-2000[ha]
forests management	10852.72	7323.13	656.09	1863.95	1009.55
sprawl of economic sites and infrastructures	2521.06	578.55	564.45	1073.23	304.82
water bodies creation and management	387.80	253.14	5.05	54.51	75.10
changes due to natural and multiple causes	287.07	80.52	0	14.61	191.94
urban residential sprawl	84.60	33.11	22.44	17.67	11.37
withdrawal of farming	87.64	34.08	0	5.62	47.94
urban land management	1003.71	241.08	372.40	0	390.23
agriculture internal conversions	111.68	92.18	0	0	19.50
conversion from forested & natural land to agriculture	495.79	104.85	63.11	0	327.83

Source: Slovenian Environmental Agency.

Planned land use in Slovenia

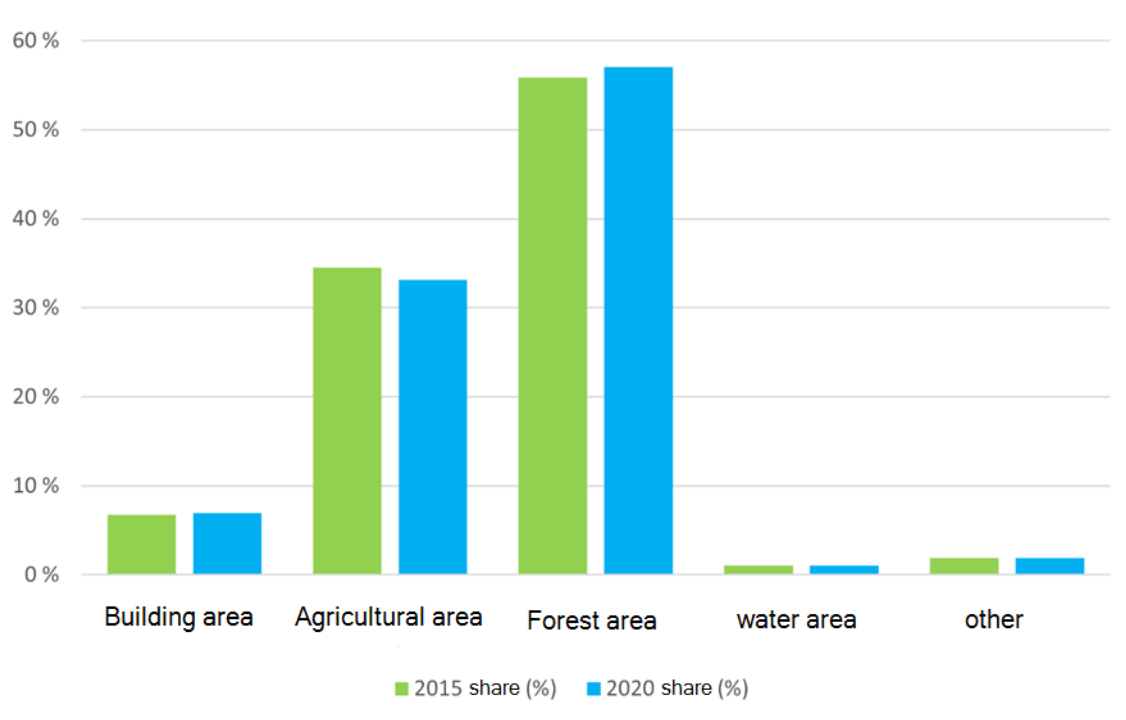
Based on data on basic planned land use (see Table 4), obtained from the collective information layer of planned land use, it is evident that in 2020 the largest share of land is covered by forest planned land use (57% or 1,177,991.69 ha), followed by agricultural planned land use (33, 11% or 683,519.17 ha). The share of building planned land use is 6.91% or 142,595.02 ha of the entire territory of Slovenia. Areas of other planned land uses represent a smaller share (1.89% or 38,973.73 ha), while the smallest share of areas comprises water bodies (1.04% or 21,434.00 ha).

Table 4 Areas of basic planned land use according to the total area of Slovenia (in ha and%) in 2020

Categories of planned land use	2015 (%)	2020 (%)	2020 (ha)	Index 2015/2020*
Building Areas	6.70%	6.91%	142,595.02	103.06
Agriculture areas	34.50%	33.11%	683,519.17	95.95
Forest areas	55.85%	57.06%	1,177,991.69	102.16
Water	1.02%	1.04%	21,434.00	101.41
Other	1.92%	1.89%	38,973.73	98.43
Total	100.00%	100.00%	2,064,513.61	

Source: UURS, MESP, 2020; *index is calculated based on shares.

Based on a comparison of basic planned land use between 2015 and 2020 (Figure 16), a slight increase in the share of building planned land use can be observed, from 6.7 to 6.91% (index 103.06), which in five years amounts to more than 4,000 ha. The share of forest planned land use (index 102.16) by more than 24,000 ha, while the share of agricultural planned land use (index 95.95) has decreased by slightly less than 28,000 ha.



Source: UURS, MESP data, 2020

Figure 16: Difference in areas of categories of basic planned land use (index 2015/2020), Slovenia 2015 2020

2.8 Switzerland

Target	Reduction of land take by a third compared to 2020 until 2030 and net zero until 2050. Target of 17% of the total area of Switzerland to be set aside for the protection of native species and plants (only draft status in the nNHG). Limitation of the number and plot area of buildings outside the building zone (Plafonierung bzw. Stabilisierungsziel), only draft status in the RPG revision process). No net land take by 2050, with compensation according to qualitative requirements, not area size (Bundesamt für Umwelt 2020:22).
Reference document	Swiss Sustainable Development Strategy 2030 Goal 15.3 (Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat 2021:24) Swiss Soil Strategy (Bodenstrategie Schweiz, Bundesamt für Umwelt 2020:22) Draft revision of the Swiss Nature and Cultural Heritage Protection Act (Natur- und Heimatschutzgesetz NHG) (Schweizer Eidgenossenschaft 2021:7) Draft revision 2 of the Swiss Spatial Planning Act (RPG) of 2021
Current land take	Total settlement area increased by 776 km ² (= average daily land take of 6.4 ha) between 1985 and 2018 and by 181 km ² between 2009 and 2018 (= average daily land take of 5.5 ha) (Bundesamt für Statistik 2021:9) ³²
Measures outlined in reference documents	Revision of the Spatial Planning Act 2014. From the entry into force of the revised law on May 1st 2014, the cantons had five years to adapt their structure plans. In cantons that do not have a structure plan approved by the Federal Council on April 30th 2019, a zoning freeze applies. The same applies if they do not have a regulation on compensation for added value that complies with the RPG. The Action Plan of the Swiss Sustainability Strategy 2021-2023 foresees to expand the basis for a monitoring of soil sealing in the form of a monitoring concept (Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat (2021b:15).
Method of quantification	Aerial photography for land use data in 10-year-intervals; for statistics of construction zone: land use planning data of cantons, revision every 5 years

In Switzerland, construction is only permitted within building zones. According to the 2017 building zone statistics ³³ (Schweizerische Eidgenossenschaft / Bundesamt für Raumentwicklung 2017), these occupy a total area of 232,038 hectares. Well over 80% of this area is already built over. About one seventh of the building zones are still undeveloped. The building zones that have not yet been built over theoretically offer space for another 1 to 1.7 million inhabitants. An overly generous designation of building zones contradicts the principle of economical use of land.

The area of building zones that have not yet been built over is too large in some cantons and regions, as more than the legally defined demand for the next 15 years is covered. Moreover, the areas of building zones that have not been built over are often located in rural areas,

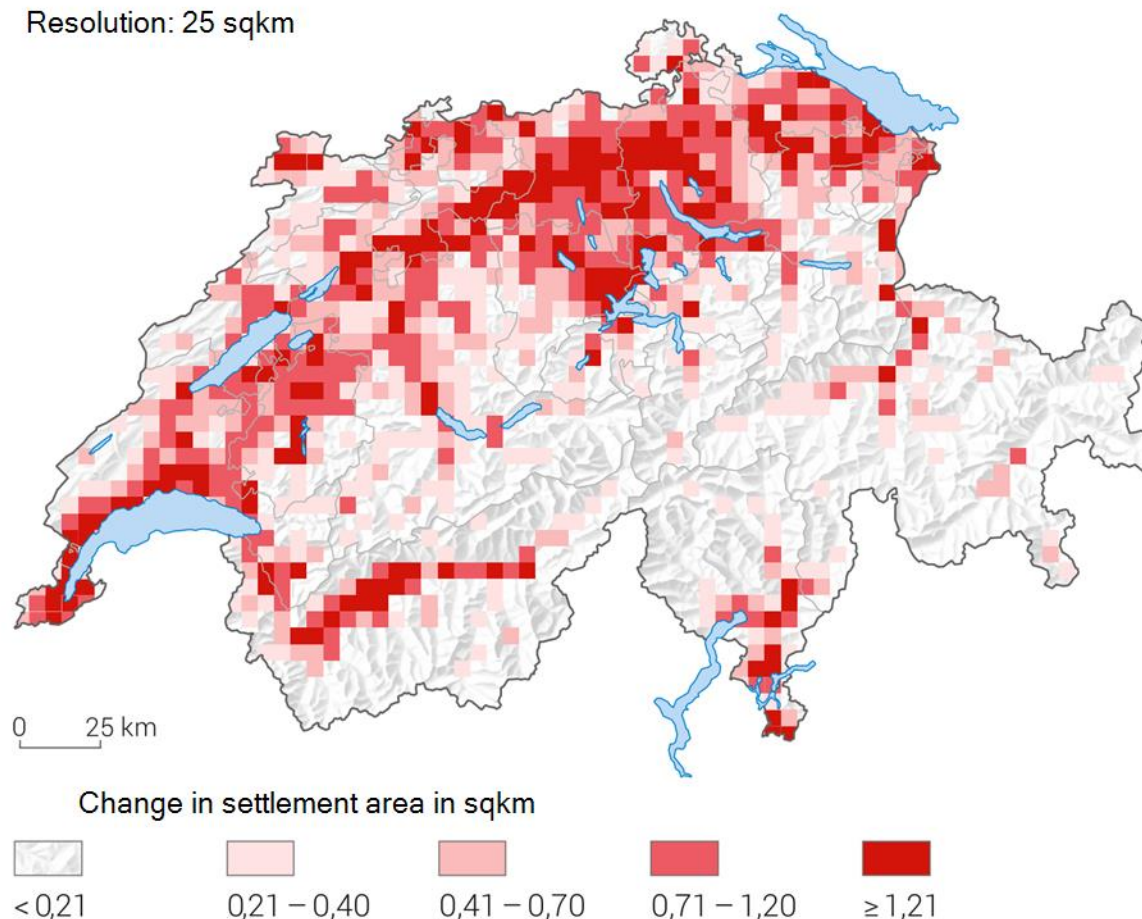
³² <https://www.bfs.admin.ch/news/de/2021-0316>

³³ Statistica delle zone edificabili / Bauzonenstatistik / statistique des zones à bâtir

especially in agricultural and tourist communities. In densely populated agglomerations with high growth dynamics and correspondingly high demand (see Figure 17), however, available land is a scarce commodity. The building zone statistics are collected every 5 years.³⁴

Settlement area 1985-2018

Resolution: 25 sqkm



Source: BFS Swiss areal statistics (AREA)

© BFS 2021

Figure 17: Settlement area increases for 25 sqkm grids 1985-2018

The discussion surrounding the revision of the Federal Act on the Protection of Nature and Cultural Heritage (NHG) illustrates a conflict of interest – at least in public debate – between densification and architectural qualities of settlements. The economic stakeholder EconomieSuisse³⁵ argues against an integration of architectural qualities (Baukultur) in the revised NHG, stating that architectural qualities are not connected to biodiversity and that inner-urban development might be obstructed by prioritisation of architectural qualities.

³⁴ <https://www.are.admin.ch/are/de/home/raumentwicklung-und-raumplanung/grundlagen-und-daten/raumbewachung/siedlung/bauzonen.html>

³⁵

<https://www.economiesuisse.ch/sites/default/files/publications/20210709%20Vernehmlassung%20indirekter%20Gegenentwurf%20Biodiversit%C3%A4tsinitiative.pdf>

In the hearing phase of the revision of the Swiss Spatial Planning Act 2021, the foreseen stabilisation of the number and plot area of buildings outside the building zone is generally supported by the national planning association EspaceSuisse, which however criticises the unclear formulation of the objective and proposes to extend it to transport infrastructure and agriculture.³⁶

Related to the reduction of land take in Switzerland is the target value of securing 17% of land cover for biodiversity purposes, proposed in Article 18 of the draft revision of the Federal Act on the Protection of Nature and Cultural Heritage (NHG). EspaceSuisse³⁷ is arguing to increase the target value to 20%, also in view of the proposed of conserving at least 30% of the global land area through systems of protected areas and other effective area-based conservation measures as part of the UN Global Biodiversity Framework.³⁸

³⁶ https://www.espacesuisse.ch/sites/default/files/documents/Revision_RPG%202_VL_2021_EspaceSuisse_d_Resume_f.pdf

³⁷ https://www.espacesuisse.ch/sites/default/files/documents/Revision_NHG_Stellungnahme_EspaceSuisse_d.pdf

³⁸ <https://www.un.org/sustainabledevelopment/blog/2021/07/a-new-global-framework-for-managing-nature-through-2030-1st-detailed-draft-agreement-debuts/>

5. SUMMARY

Based on the screening of the status quo of land-saving targets in the Alps, the following aspects can be underlined:

- At a national level, Austria, France, Germany, Slovenia and Switzerland have adopted quantitative land-saving targets in the form long-term targets (net-zero by 2050) and/or mid-term (2030) target. Austria, Italy, Liechtenstein and Monaco have not adopted a net zero target.
- At federal state resp. regional level, Bavaria, Auvergne-Rhône-Alpes, Provence-Alpes-Côte d'Azur, Piedmont, Veneto and Lombardy have adopted quantitative land saving targets. Auvergne-Rhône-Alpes and Piedmonte are even aiming to achieve the net zero target by 2040.
- While lacking a quantitative land saving target at national level, binding implementation mechanisms exist in the Italian regions (Piedmont, Lombardy and Veneto)
- While not pursuing a quantitative land saving target, the region of Trentino-Alto Adige is requiring municipalities to delineate their urbanisation areas based on a registry of vacant land

Summing up, three approaches to land saving targets can be classified:

- Voluntary targets at national level without regionalisation or cap (AT, DE, FR, SI). For France, targets and trajectories have to be adapted at the regional, subregional and municipal spatial planning level, meeting specific deadlines.
- Regionalised land saving targets (Italian regions, not realised but foreseen for French Regions in the course of the following years)
- Regulatory framework that limits urbanisation at municipal level based on binding mechanisms (CH, South Tyrol), but without explicit regionalisation of quantitative targets

Figure 18 illustrates that Alpine countries as well as the regions that have adopted land saving targets are still facing considerable challenges in regard to reducing land take and embarking on reduction pathways that would lead to net zero land take by 2050. However, the topic is very dynamic in many parts of the Alps and discussions on effective instruments can be expected to intensify when approaching the crucial timeline of 2030.

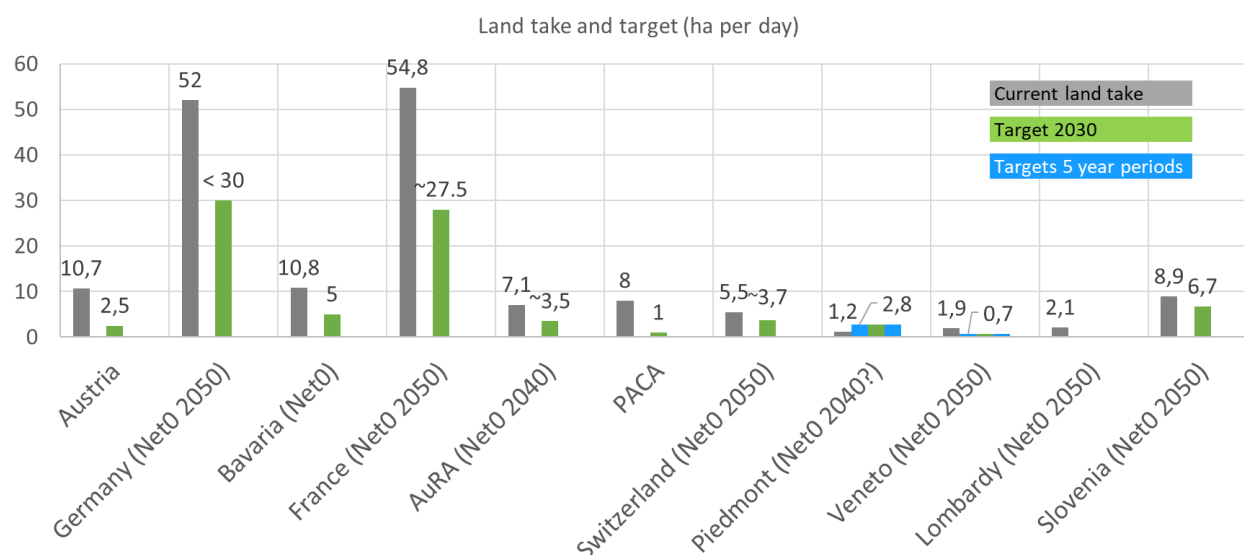


Figure 18: Current land take and land saving targets in selected Alpine countries and regions.

BIBLIOGRAPHY

Alpine Convention (2020): Economic and prudent use of soil. Report prepared by the WG Soil Protection and the Permanent Secretariat of the Alpine Convention. Innsbruck.

Autonome Provinz Bozen – Südtirol / Provincia Autonoma di Bolzano - Alto Adige (2018): „Anwendungsrichtlinien zur Einschränkung des Bodenverbrauchs“ / “Criteri applicativi per il contenimento del consumo di suolo. Dekret des Landeshauptmanns of November 22 2018, Nr. 31 / Decreto del president della provincia del 22 novembre 2018, n. 31.

Autonome Provinz Bozen – Südtirol / Provincia Autonoma di Bolzano - Alto Adige (2014): Beschluss der Landesregierung vom 5. August 2014, Nr. 964: Richtlinien für die Anwendung des „Energiebonus“ im Sinne von Artikel 127 des Landesgesetzes vom 11. August 1997, Nr. 13, in geltender Fassung / Deliberazione della giunta provincial del 5 agosto 2014, n. 964 / Direttive di applicazione del “bonus energia” ai sensi dell’articolo 127 della legge provinciale 11 agosto 1997, n. 13, e successive modifiche.

[https://www.klimahaus.it/smarteredit/documents/inhalte/_Inhalte_Downloads/_published/Energiebonus-\(BLR-5.-August-2014-Nr.-964\).pdf](https://www.klimahaus.it/smarteredit/documents/inhalte/_Inhalte_Downloads/_published/Energiebonus-(BLR-5.-August-2014-Nr.-964).pdf)

Bayerische Staatsregierung (2020): Flächensparoffensive. München.

https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/Publikationen/2020/2020-05-07_Flaechensparoffensive-2020-05.pdf

Bundesamt für Statistik (2021): Die Bodennutzung in der Schweiz. Resultate der Arealstatistik 2018. 02 Raum und Umwelt. Neuchâtel. <https://www.bfs.admin.ch/bfsstatic/dam/assets/19365051/master>

Bundesamt für Umwelt (2020): Bodenstrategie Schweiz. Bern.

https://www.bafu.admin.ch/dam/bafu/de/dokumente/boden/ud-umwelt-diverses/bodenstrategie-schweiz.pdf.download.pdf/Bodenstrategie_2020-05-01.pdf

Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (2002): Die österreichische Strategie zur Nachhaltigen Entwicklung. Eine Initiative der Bundesregierung. Wien.

Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (2017): Aufschwung für den Ländlichen Raum. Masterplan Ländlicher Raum. Wien.

<https://info.bmlrt.gv.at/dam/jcr:a981bda1-1689-4d1f-87cf-9fc5418522cb/MASTERPLAN%20f%C3%BCr%20den%20l%C3%A4ndlichen%20Raum.pdf>

Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (2016): Klimaschutzplan 2050. Klimaschutzpolitische Grundsätze und Ziele der Bundesregierung. Berlin.

https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/klimaschutzplan_2050_bf.pdf

Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (2016): Den ökologischen Wandel gestalten. Integriertes Umweltprogramm 2030. Berlin.

https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/integriertes_umweltprogramm_2030_bf.pdf

Cerema Hauts-de-France (2020a): L’artificialisation et ses determinants d’après les Fichiers fonciers Période 2009-2017 – Chiffres au 1er janvier 2017. Paris.

https://datafoncier.cerema.fr/sites/datafoncier/files/inline-files/rapport%20analyse%20V9_light.pdf

Cerema Hauts-de-France (2020b): Les déterminants de la consommation d’espaces Période 2009-2019 – Chiffres au 1er janvier 2019. Paris. https://artificialisation.developpement-durable.gouv.fr/sites/artificialisation/files/inline-files/rapport_V7_2009-2019.pdf

Colsaet, Alice (2019): Land take in France: what political progress, for what results? IDDRI Issue Brief Nr. 02/2019.

Commissariat général au développement durable (2019): Trajectoires vers l'objectif « zéro artificialisation nette » Éléments de méthode.

<https://www.ecologie.gouv.fr/sites/default/files/Th%C3%A9matique%20-%20Trajectoires%20vers%20l%E2%80%99objectif%20z%C3%A9ro%20artificialisation%20nette.pdf>

Deutsche Bundesregierung (2018): Deutsche Nachhaltigkeitsstrategie. Berlin.

<https://www.bundesregierung.de/resource/blob/975274/1546450/65089964ed4a2ab07ca8a4919e09e0af/2018-11-07-aktualisierung-dns-2018-data.pdf?download=1>

Federici, Maurizio (2020): Il piano territoriale regionale integrato ai sensi della L.R. 31/2014.

Presentation at <http://www.ordinearchitetticomo.it/wp-content/uploads/2020/01/RL-Presentazione-COMO-21gennaio2020.pdf>

France Strategie (2019): Objectif « Zéro artificialisation nette »: quels leviers pour protéger les sols? Paris.

Ministre de la Transition écologique (2018): Plan national biodiversité. Paris.

Österreichische Raumordnungskonferenz (2021): Österreichisches Raumentwicklungskonzept ÖREK 2030. Raum für Wandel. Wien.

https://www.oerek2030.at/fileadmin/user_upload/Dokumente_Cover/OEREK-2030.pdf

Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (2010): Österreichische Nachhaltigkeitsstrategie (ÖSTRAT), Wien.

Prefet de la Region Auvergne-Rhone Alpes (2019): La stratégie eau - air – sol en Auvergne-Rhône-Alpes. 32 actions. Livre blanc. <http://www.auvergne-rhone-alpes.developpement-durable.gouv.fr/IMG/pdf/eauairsol--livreblancdef-aveccompression.pdf>

Prefet de la Region Auvergne-Rhone Alpes (2021): eauairsol. Première réussite.

https://www.prefectures-regions.gouv.fr/auvergne-rhone-alpes/content/download/82633/533410/file/EauAirSol--En_pratique_web.pdf

Prefet de la Région Provence-Alpes-Côte d'Azur (2022): Accompagner les territoires pour concilier développement et sobriété foncière. Marseille. <https://fr.calameo.com/cc/provence-alpes-cote-dazur/books/0048521003ea0463de60e>.

Région Provence-Alpes-Côte d'Azur (2019): Schéma régional d'aménagement, de développement durable et d'égalité des territoires. <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/le-schema-regional/>

Région Provence-Alpes-Côte d'Azur (2019): Stratégie régionale pour une gestion plus efficiente du foncier. <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/la-mise-en-oeuvre/les-guides-de-mise-en-oeuvre-du-sraddet/details-des-documents-ressources/fiche/strategie-regionale-pour-une-gestion-plus-efficiente-du-foncier-en-provence-alpes-cote-dazur/>

Région Provence-Alpes-Côte d'Azur (2021): Plan Climat 2 – Gardons une COP d'avance.

<https://www.maregionsud.fr/a-la-une/plan-climat-gardons-une-cop-davance>

Regione del Veneto (2018): Legge regionale 6 giugno 2017, n. 14. Allegato C DGR nr. 668 del 15 maggio 2018. Venezia.

Regione Lombardia (2010, 2019): Piano Territoriale Regionale della Lombardia. Documento di Piano. Milano.

Regione Piemonte (2011): Piano Territoriale Regionale. Norme di attuazione. Torino.

<https://www.regione.piemonte.it/web/sites/default/files/media/documenti/2018-11/attuazione.pdf>

Republic of Slovenia (2017): Porocilo o okolju v Republiki Sloveniji 2017. Ljubljana.
https://www.gov.si/assets/ministrstva/MOP/Dokumenti/porocilo_o_okolju_2017.pdf

Republic of Slovenia (2020): Resolucija o Nacionalnem programu varstva okolja za obdobje 2020–2030 (ReNPVO20–30). Ljubljana. <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985>.

Republik Österreich (2020): Aus Verantwortung für Österreich. Regierungsprogramm 2020-2024. Wien. <https://www.bundestkanzleramt.gv.at/dam/jcr:7b9e6755-2115-440c-b2ec-cbf64a931aa8/RegProgramm-lang.pdf>

Schweizerische Eidgenossenschaft (2021): Botschaft zur Volksinitiative „Gegen die Verbauung unserer Landschaft (Landschaftsinitiative)“. Entwurf. Bern.
https://www.are.admin.ch/dam/are/de/dokumente/recht/dokumente/erlass/entwurf-botschaft-landschaftsinitiative.pdf.download.pdf/entwurf-botschaft-landschaftsinitiative_de.pdf

Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat (2021a): Strategie Nachhaltige Entwicklung 2030. Bern.
https://www.are.admin.ch/dam/are/de/dokumente/nachhaltige_entwicklung/publikationen/sne2030.pdf.download.pdf/Strategie%20Nachhaltige%20Entwicklung%202030.pdf

Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat (2021b): Aktionsplan 2021-2023 zur Strategie Nachhaltige Entwicklung 2030. Bern.
https://www.are.admin.ch/dam/are/de/dokumente/nachhaltige_entwicklung/publikationen/aktionsplan2021-2023.pdf.download.pdf/Aktionsplan%202021-2023%20zur%20Strategie%20Nachhaltige%20Entwicklung%202030.pdf

Schweizerische Eidgenossenschaft / Bundesamt für Raumentwicklung (2017): Bauzonenstatistik Schweiz 2017. Bern.
https://www.are.admin.ch/dam/are/de/dokumente/grundlagen/dokumente/bauzonenstatistik-schweiz-2017-statistik-und-analysen.pdf.download.pdf/Bauzonenstatistik_Schweiz_2017.pdf

Senato della Repubblica (2021): Proposta di piano per la transizione ecologica. Atto del Governo 297. Dossier 14 settembre 2021. Roma.
http://documenti.camera.it/leg18/dossier/pdf/Am0143.pdf?_1647602057438

Sistema Nazionale per la Protezione dell'Ambiente (2021): Consumo di suolo, dinamiche territoriali e servizi ecosistemici. Edizione 2021. Rome. https://www.snpambiente.it/wp-content/uploads/2021/07/Rapporto_consumo_di_suolo_2021-1.pdf

Umweltbundesamt (2017): Quo vadis Bodenschutz in den Alpen? Bilanzierung des Protokolls Bodenschutz der Alpenkonvention. Endbericht. UBA Texte 27/2017. Dessau-Roßlau.