Comitato consultivo sul clima alpino – Piano d'azione sul clima 2.0 – DRAFT/BOZZA

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1. Introduzione: Situazione iniziale e obiettivi

Situazione iniziale: attività della Convenzione delle Alpi sul cambiamento climatico dal 2006 al 2019[1]

Le Alpi subiscono impatti collegati al cambiamento climatico più rapidi e maggiori rispetto a quanto avviene in altre regioni europee. L'innalzamento della temperatura media nell'area alpina è di circa due volte superiore a quello delle aree limitrofe, e le conseguenze del cambiamento climatico (come i più frequenti eventi metereologici estremi e i pericoli naturali) colpiscono in modo spropositato sia la società che l'economia delle Alpi. Allo stesso tempo, possiamo osservare come la regione alpina abbia molteplici sorgenti di emissioni, provenienti in particolare dai settori dei trasporti e del turismo, nonché da quello abitativo: ciò potrebbe farla diventare una regione modello per realizzare una decarbonizzazione *smart*. Poiché il cambiamento climatico non si arresta alle frontiere nazionali, e le molte e necessarie strategie di mitigazione e di adattamento richiedono approcci coordinati, i Paesi alpini hanno riunito le proprie forze sotto l'egida della Convenzione delle Alpi.

Già nel 2006, le Parti contraenti della Convenzione delle Alpi avevano approvato una Dichiarazione sui cambiamenti climatici proprio per rafforzare la loro cooperazione. Un Piano d'azione sul clima aveva individuato 24 obiettivi e raccomandato misure concrete in otto diversi settori, a cui si sono aggiunti nel 2009 quello della ricerca e quello della sensibilizzazione della collettività. In seguito, su queste basi sono stati definiti nel corso degli anni successivi i compiti degli organi della Convenzione delle Alpi. Nel 2016, la XIV Conferenza delle Alpi ha individuato la tematica "Adottare misure per il contrasto ai cambiamenti climatici" come una delle sei priorità del suo Programma di Lavoro Pluriennale (MAP/PLP) per il periodo 2017-2022, inoltre, ha altresì deciso di istituire il Comitato consultivo sul clima alpino (ACB) per accorpare tutte le attività relative alla mitigazione e all'adattamento ai cambiamenti climatici portate avanti nell'ambito della Convenzione delle Alpi. Tale Comitato (ACB), composto da rappresentanti di tutti gli Stati alpini e da molti Osservatori della Convenzione delle Alpi, ha cominciato il proprio lavoro all'inizio del 2017.

Tutte le attività del Comitato consultivo sul clima alpino vengono intraprese sulla base dei contenuti della Convenzione quadro delle Nazioni Unite sui Cambiamenti Climatici (UNFCCC), dell'Accordo di Parigi, degli Obiettivi per lo sviluppo sostenibile (OSS), e della relativa legislazione europea sul clima, con particolare riguardo alla Legge europea sul clima (che stabilisce il quadro per un'Europa clima-neutrale entro il 2050), e alla Strategia di adattamento dell'Unione europea. Complessivamente, le attività sono inserite nel quadro giuridico della Convenzione delle Alpi, con i suoi Protocolli, le sue Decisioni e i rispettivi obiettivi e target.

Richiamando i principali traguardi raggiunti, occorre evidenziare come il Comitato Consultivo sul clima alpino (ACB) abbia sviluppato il **Sistema alpino di obiettivi per il clima 2050:** che consiste in obiettivi prevalentemente soft, ma verificabili entro il 2050, volti a rafforzare il valore aggiunto della cooperazione a livello alpino relativamente alla mitigazione e all'adattamento al cambiamento climatico (approccio integrato). La trasformazione delle Alpi in una regione clima-neutrale e resiliente ai cambiamenti climatici è il suo principale obiettivo e, affinché possa essere raggiunto, sono già stati definiti alcuni principi generali. Il Sistema alpino di obiettivi per il clima 2050 segue un approccio settoriale, ed elabora finalità concrete in dieci diversi ambiti di attività della Convenzione delle Alpi, a cui si sono aggiunte due aree di intervento trasversali/orizzontali. La XV Conferenza delle Alpi ha adottato il Sistema alpino di obiettivi per il clima 2050 nell'aprile 2019, conferendo poi un mandato al

[1] Per la relativa documentazione: www.alpconv.org.

Comitato consultivo sul clima alpino (ACB) perché lo rendesse operativo e aggiornasse il Piano d'azione sul clima del 2009.

Obiettivi e approccio del Piano d'azione sul clima 2.0

Il Piano d'azione sul clima 2.0 aggiornato è stato sviluppato dal Comitato consultivo sul clima alpino (ACB) nel periodo di lavoro 2019-2020, dando priorità a specifiche misure per implementare il Sistema alpino di obiettivi per il clima 2050 in dieci settori di attività; i temi orizzontali (azione a livello comunale nonché di ricerca e sviluppo) sono integrati con le proposte di settore. Il Piano d'azione è calibrato su un orizzonte a medio termine (i prossimi cinque/dieci anni) e propone dettagliati percorsi attuativi, che stanno per essere avviati o che possono essere iniziati entro uno o due anni, per essere eventualmente e ulteriormente sviluppati fino al 2030.

I percorsi attuativi costituiscono il fulcro del Piano d'azione sul clima 2.0, poiché assicurano una sequenza smart e una combinazione di misure, che permettono di individuare misure di maggiore impatto. Tutti i percorsi attuativi sono stati sviluppati coinvolgendo più soggetti **(stakeholder approach),** integrando input e idee provenienti da dai vari gruppi di stakeholder a seguito di workshop, feedback e colloqui con esperti. I Gruppi di lavoro tematici della Convenzione delle Alpi sono stati fattivamente coinvolti nel processo e giocheranno, successivamente, un ruolo importante nell'attuazione dei percorsi.

Attraverso il coinvolgimento dei rappresentanti degli Stati alpini, i seguenti percorsi attuativi e il Piano d'azione sul clima 2.0 tengono in considerazione le **misure e i programmi transnazionali, nazionali e regionali** attualmente in fase di implementazione in vari Paesi alpini. Inoltre, sono state tenute in debito conto[2] anche le buone pratiche sviluppate dagli Osservatori e da altri importanti stakeholder. L'obiettivo del Piano d'azione sul clima 2.0 non è infatti quello di duplicare le attività in corso ma, anzi, è quello di assicurare le sinergie tra le varie attività, colmando le parti mancanti, con una particolare attenzione all'azione transfrontaliera.

Sulla base di questo approccio, il Comitato consultivo sul clima alpino (ACB) ha sviluppato da due a quattro percorsi attuativi per ciascun settore. Sono stati dunque individuati complessivamente trenta percorsi attuativi (l'elenco completo è allegato a questo documento). Il Comitato Consultivo sul clima alpino (ACB) ha poi proceduto a una valutazione interna, che ha portato all'individuazione dei percorsi prioritari, sulla base di quattro criteri selettivi:

1) Rilevanza a livello alpino e interfaccia diretta con la Convenzione delle Alpi
2) Propensione al cambiamento
3) Rilevanza politica nel breve termine (sostegno agli attuali decisori politici)
4) Fattibilità dell'implementazione nel breve periodo.

[2] Le misure e i programmi attuati nei Paesi alpini, nonché le buone pratiche messe in atto dagli Osservatori e da altri stakeholder, sono riassunti nella relazione di inventario del Comitato consultivo sul clima (https://www.alpconv.org/fileadmin/user_upload/Organization/TWB/ACB/ACB_Stock-taking_report_2019.pdf). Una sua prima versione è stata pubblicata come documento di riferimento per la XV Conferenza delle Alpi; un suo aggiornamento sarà sviluppato nel 2021 come base per le ulteriori attività del Comitato consultivo sul clima. Inoltre, le schede informative, che descrivono in dettaglio ogni singolo percorso attuativo (alla base del Piano d'azione sul clima 2.0) comprendono una sezione sulle relative attività esistenti, sulle buone pratiche e sulle situazioni iniziali. Pertanto, il Piano sul clima di per sé non comprende alcuna informazione aggiuntiva sulle buone pratiche.

In base a questi criteri sono stati individuati sedici percorsi prioritari, che costituiscono il fulcro dell'attuale Piano d'azione sul clima 2.0.

Integrare il Piano d'azione sul clima 2.0 nelle misure di ripresa da COVID-19

Dall'inizio del 2020, il mondo è stato gravemente colpito dalla pandemia da COVID-19, minacciando anche la salute e la vita nell'area alpina. A seguito delle misure di confinamento, la situazione economica mondiale ha subito un duro colpo, con la minaccia di una grave fase recessiva, elevati livelli di disoccupazione e situazioni di difficoltà. Alcuni settori particolarmente rilevanti per l'economia delle regioni alpine (specialmente quello turistico, così come anche l'intero indotto a esso collegato) sono stati messi in ginocchio dall'iniziale blocco e dalle successive restrizioni, come tra l'altro l'impossibilità di viaggiare o di organizzare eventi sportivi e culturali su vasta scala. Alcune realtà, poi, che nei mesi precedenti avevano registrato un positivo andamento, dovranno affrontare nuove sfide a seguito della pandemia da COVID-19 (ad esempio, in una tale situazione, la scelta della mobilità condivisa è sicuramente meno allettante).

Con riferimento al Piano d'azione sul clima 2.0, va detto che la crisi scatenata da COVID-19 porta con sé molte opportunità, in particolare grazie ai Programmi di rilancio, dotati di notevoli risorse, predisposti proprio per incentivare l'economia europea a medio e lungo termine. L'approccio della "Green Recovery" prevede una serie di primi passi per molti interventi, così come proposto nello stesso Piano d'azione sul clima 2.0, nel quale tali sinergie sono messe in rilievo. Inoltre, vengono indicate misure sulle quali i Programmi di rilancio dovranno essere attentamente finalizzati e implementati, proprio per evitare qualsivoglia effetto di chiusura.

Struttura del Piano d'azione sul clima 2.0 – "percorsi prioritari" e insieme di idee

Il Piano d'azione sul clima 2.0 fornisce precise informazioni sui **percorsi prioritari** per ognuno dei dieci settori di attività: un'introduzione relativa alle specifiche sfide, i rispettivi obiettivi forniti dal Piano d'azione sul clima e una breve descrizione delle fasi concrete. Questi percorsi prioritari dovrebbero essere presi in carico dalla Convenzione delle Alpi, possibilmente attraverso le Parti contraenti, i diversi Gruppi di lavoro tematici della Convenzione delle Alpi, gli Osservatori e gli altri soggetti interessati. Il Comitato consultivo sul clima alpino ne guiderà l'effettiva attuazione, supportando e monitorando il processo.

Il Piano d'azione sul clima 2.0 prevede anche delle proposte specifiche per realizzare interventi trasversali da effettuarsi a livello della Convenzione delle Alpi, compresa l'inclusione del Piano d'azione sul clima 2.0 all'interno del più ampio quadro della politica sul clima, della governance di implementazione dei partenariati e del relativo monitoraggio, oltre che la definizione di elementi per una strategia di comunicazione.

Infine, il Piano d'azione sul clima 2.0 stabilisce l'iter e le responsabilità per il processo di attuazione.

Nel suo allegato, il Piano d'azione sul clima 2.0 fornisce maggiori dettagli sia sui sedici percorsi prioritari che sugli altri percorsi di attuazione proposti, come un insieme di idee per lo sviluppo di ulteriori attività verso le Alpi clima-neutrali e resilienti ai cambiamenti climatici.

2. Priorità dell'azione per il clima – definizione delle attività per i settori del Sistema alpino di obiettivi per il clima

1. I trasporti sono una grande fonte di emissioni di CO_2 nelle Alpi e, per questa ragione, un trasferimento modale comune, una strategia di decarbonizzazione e un approccio coordinato per integrare soluzioni di mobilità alternativa sono state individuate come azioni prioritarie.
2. La realizzazione della transizione energetica nelle Alpi richiede soluzioni su misura, che saranno supportate da una rete di coordinatori regionali per l'energia e da azioni pilota su stili di vita e modelli di business improntati alla neutralità climatica.
3. Il turismo, considerato attività economica chiave e interfaccia verso altri settori, richiede un maggior coordinamento di strategie e di strumenti per gestire la trasformazione verso la neutralità climatica e la resilienza ai cambiamenti climatici.
4. I pericoli naturali non si arrestano alle frontiere nazionali o regionali e, per questo motivo, è necessario un approccio comune di gestione del rischio per affrontare i rischi transfrontalieri.
5. I sistemi idrici nelle Alpi sono fortemente interconnessi a livello transfrontaliero e richiedono un approccio alpino per una gestione dell'acqua "a prova di clima", compresa la predisposizione di un piano di gestione integrato per situazioni di siccità.
6. Le strutture territoriali nelle Alpi, essendo molto specifiche, necessitano di approcci personalizzati, da realizzare attraverso lo sviluppo di un ampio concetto alpino di pianificazione territoriale nel quadro dell'azione sul clima.
7. Il suolo alpino affronta molteplici sfide derivanti dal cambiamento climatico e richiede un quadro comune per preservarne la qualità e la quantità.
8. Gli agricoltori delle Alpi utilizzano metodi di decarbonizzazione dell'agricoltura attraverso il potenziamento delle tecniche di agricoltura biologica e clima-neutrale, nonché delle catene di valore locali.
9. Le foreste possono svolgere numerose funzioni utili per le Alpi clima-neutrali e resilienti ai cambiamenti climatici, ma solo nella misura in cui saranno accelerate le tecniche di gestione e di conversione verso foreste più resilienti e vicine alla natura.
10. Gli ecosistemi alpini sono un hotspot globale di biodiversità, ma sono estremamente sensibili alle alterazioni, e quindi richiedono un'attenta gestione per essere resilienti e poter mantenere i loro servizi.

Trasporti

I trasporti sono una grande fonte di emissioni di CO_2 nelle Alpi…

I trasporti costituiscono una delle cause più rilevanti del cambiamento climatico nelle Alpi; infatti, quasi il 30% di tutti i gas ad effetto serra è da attribuire a emissioni legate al trasporto passeggeri e merci. In particolare, il trasporto merci, pone alcune sfide specifiche per le Alpi, in quanto numerosi **corridoi chiave della rete europea dei trasporti** attraversano il perimetro alpino. Questi flussi di trasporto merci a lunga distanza provocano una ragguardevole quantità di emissioni di CO_2 rispetto al complesso del trasporto alpino, in particolare lungo i principali corridoi di transito; e la loro decarbonizzazione è possibile solamente applicando un approccio comune, in stretta collaborazione con i partner a livello europeo, nazionale e regionale, e con il coinvolgimento dei rispettivi stakeholder del settore trasporti.

Analogamente, le strategie di trasferimento modale per il trasporto passeggeri devono essere in grado di rispondere alle specifiche sfide della regione alpina, legate alla mobilità transfrontaliera, alle esigenze di mobilità nelle regioni remote, nonché a specifici modelli di domanda correlati al traffico turistico. I veicoli del trasporto pubblico devono poter rispondere alle specifiche necessità delle Alpi (ad esempio: prevedere degli spazi per il trasporto delle biciclette), e dovrebbero avvalersi di tecnologie clima-neutrali. L'attrattività crescente del trasporto pubblico e le possibilità di attuare una mobilità condivisa devono prevedere un'informazione facilmente accessibile sui servizi forniti e un accattivante sistema di bigliettazione. Nel quadro della recente pandemia da COVID-19, la necessità di mantenere soluzioni di trasporto pubblico attrattive diventa particolarmente sfidante, e un approccio integrato al sistema di bigliettazione potrebbe anche migliorare i sistemi di prenotazione smart, opportunità questa per ottimizzare il servizio durante una situazione contraddistinta da misure restrittive.

… per questo un trasferimento modale comune, una strategia di decarbonizzazione e un approccio coordinato per integrare soluzioni di mobilità alternativa sono state individuate come azioni prioritarie …

Nel quadro del Piano d'azione sul clima, la **Conferenza delle Alpi si impegna a promuovere lo sviluppo di una comune strategia di trasferimento modale per il trasporto merci nell'arco alpino e la creazione di un approccio a livello alpino finalizzato a integrare e a decarbonizzare le soluzioni di mobilità alternativa.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per evitare disomogenei effetti distributivi indesiderati tra i corridoi alpini e
- per assicurare che le strategie e le azioni verso la decarbonizzazione del trasporto passeggeri e merci diventino pienamente operative.

Per sviluppare questa strategia di trasferimento modale, **la Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Implementare un quadro politico comune per il trasferimento modale, basato su misure di indirizzo (ad esempio: il *Toll Plus*, un sistema di tariffazione mirato e armonizzato nelle aree di montagna sensibili, oppure l'*Alpine Crossing Exchange* - Borsa dei Transiti Alpini (BTA) e inteso come approccio cap-and-trade per limitare i volumi di trasporto complessivi);

- Supportare gli stakeholder nell'adozione di tecnologie innovative, in particolare per il trasporto ferroviario e per quello combinato (merci), nonché per i veicoli del trasporto pubblico, al fine di assicurare che tengano il passo nella corsa verso l'innovazione;
- Sviluppare raccomandazioni per la progressiva eliminazione dei veicoli con motori a combustione interna nei corridoi alpini di transito, facendo in modo che negli ambienti alpini sensibili venga usata la migliore flotta di veicoli disponibile;
- Attuare un sistema di informazione e di bigliettazione integrata per il trasporto pubblico a livello alpino.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le proprie forze per attuare le seguenti attività, descritte in dettaglio nell'allegato:

Per il trasporto merci:

- Fare lobbying per il Toll Plus allo scopo di incrementare sia la consapevolezza dell'importanza della Direttiva Eurovignette, intesa come cornice europea fondamentale per il pedaggio stradale, sia l'esigenza di mantenere l'ambizioso approccio del processo di revisione in corso;
- Creare un hub di conoscenza integrato a livello alpino sulle tecnologie innovative per il trasporto ferroviario e per quello combinato, al fine di incentivarne e sostenerne l'innovazione;
- Avviare strategie regionali per l'eliminazione graduale dei veicoli con motore a combustione interna in base ai dibattiti in corso sulla regolamentazione del loro utilizzo nei vari settori del trasporto merci su strada;
- Supportare l'implementazione di un sistema di Toll Plus attraverso specifiche raccomandazioni su come implementare il Toll Plus a livello nazionale, al fine di prevedere ulteriori incentivi finanziari per il trasferimento modale (dopo che sarà stato ultimato il processo di revisione della Direttiva Eurovignette);
- Borsa dei Transiti Alpini: fornire supporto per un approccio cap-and-trade come quello della BTA, in base alle discussioni relative alle opzioni su come sostenerne politicamente l'implementazione.

Per il trasporto passeggeri:

- Estendere i biglietti Youth Alpine Interrail per continuare e sviluppare ulteriormente il progetto Youth Alpine Interrail nei prossimi anni;
- Completare e implementare un sistema di informazione e bigliettazione a livello alpino sul trasporto pubblico e sulle soluzioni di mobilità alternativa, integrati nei piani di mobilità regionali e locali;
- Emettere nuovi biglietti di mobilità – sviluppare ulteriormente l'Alpine Interrail per aumentare il ricorso all'uso del trasporto pubblico, in particolare per quanto riguarda la mobilità transfrontaliera e quella legata al turismo;
- Coordinare i programmi di finanziamento alpino per le flotte di trasporto pubblico clima-neutrali, per far diventare la regione alpina una regione modello nell'adozione di veicoli di trasporto pubblico clima-neutrali.

Energia

Realizzare la transizione energetica nelle Alpi richiede soluzioni su misura …

I Paesi alpini sostengono la **visione Alpi Rinnovabili**, che richiede una promozione e uno sviluppo ambiziosi delle fonti energetiche rinnovabili nelle Alpi. Se consideriamo la sensibilità dell'ambiente alpino e i potenziali conflitti tra i nuovi progetti per le energie rinnovabili da un lato, e la protezione del paesaggio con la tutela ambientale dall'altro, emerge la necessità di attuare un approccio coordinato e intelligente: sarà così possibile indirizzare lo sviluppo delle fonti rinnovabili verso luoghi con un elevato potenziale di successo, assicurandosi che vengano attentamente valutati i vari compromessi sociali e ambientali. Inoltre, lo **sviluppo di soluzioni di efficienza energetica** deve rispondere alle specifiche esigenze di aree a bassa densità demografica. Per conseguire importanti risparmi energetici, la transizione verso le Alpi clima-neutrali richiederà anche un **cambiamento nelle abitudini comportamentali, negli stili di vita e nei modelli di business** che, avendo nelle Alpi caratteristiche specifiche, necessitano di approcci personalizzati. Infine, con riguardo all'adattamento, è necessaria una specifica disamina degli effetti avversi del cambiamento climatico sul sistema energetico.

Il livello regionale e quello locale sono interfacce fondamentali per implementare le fonti rinnovabili e le misure di efficienza energetica, perciò risulta necessario prevedere un supporto specifico per attuare soluzioni di mitigazione e di adattamento che siano "su misura per le Alpi".

… che saranno supportate da una rete di coordinatori regionali per l'energia e da azioni pilota su stili di vita e modelli di business clima-neutrali …

La **Conferenza delle Alpi si impegna a promuovere, a livello alpino, la creazione di una rete di coordinatori regionali per l'energia, nonché a mettere in atto delle azioni pilota per gli stili di vita e i modelli di business clima-neutrali.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per colmare il "divario di attuazione" e riunire le esigenze dei diversi comuni affinché possano essere sviluppate soluzioni congiunte (accorpamento delle attività);
- per sostenere campagne mirate a sviluppare una maggiore sensibilità su questi temi e potenziare gli strumenti tendenti a favorire stili di vita clima-neutrali, evidenziando le specifiche necessità delle Alpi per avviare attività ambiziose livello individuale (effetto moltiplicatore).

Per procedere con lo sviluppo di tali strutture di supporto a livello regionale e incentivare il cambiamento comportamentale a livello locale, la **Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Insediare e istituzionalizzare una rete di coordinatori regionali per l'energia nelle Alpi, sviluppando le strutture già esistenti in alcuni Paesi alpini e supportando le attuali agenzie per l'energia, attraverso l'esercizio di un più incisivo ruolo di coordinamento. La rete così individuata consentirà di migliorare capacità e conoscenze sulla transizione energetica nelle Alpi e di avviare le misure specifiche di implementazione. A tutti i coordinatori regionali per

l'energia dovrebbe essere conferito il mandato di sviluppare azioni pilota che siano ambiziose e innovative, considerando la mitigazione e l'adattamento come delle vere e proprie sfide;
- Sviluppare un programma di formazione rivolto ai coordinatori regionali per l'energia e una piattaforma per il trasferimento e la condivisione delle conoscenze, allo scopo di sostenere il costante confronto all'interno della rete;
- Rivolgere una particolare attenzione al cambiamento degli stili di vita e dei modelli di business nelle Alpi. Per questa ragione, sarà sviluppata una toolbox destinata ai nuclei familiari e alle PMI delle zone alpine, al fine di rilevare il loro impatto sul clima e di individuare così specifici e mirati interventi, che saranno poi testati e verificati in tutti i Paesi alpini nel quadro delle azioni pilota.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le proprie forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

Per sostenere la creazione di una rete di coordinatori regionali per l'energia:

- Realizzare un approccio strategico e creare una rete di coordinatori regionali, sviluppando le strutture esistenti, ma con l'obiettivo principale di ottenere un approccio comune che garantisca un vero e proprio trasferimento di conoscenze;
- Attuare azioni pilota per supportare soluzioni energetiche decentrate nelle Alpi, implementate attraverso la nuova rete (includendo anche soluzioni smart grid);
- Individuare un programma di formazione alpino rivolto ai componenti della rete dei coordinatori per l'energia, perché siano destinatari diretti di attività di formazione, addestramento e confronto a loro specificamente dedicate;
- Mettere in atto una fase di ampliamento e di diffusione che copra non soltanto ulteriori regioni dell'area alpina ma che arrivi anche a regioni situate in un perimetro più vasto.

Per supportare stili di vita e modelli di business clima–neutrali nelle Alpi:

- Effettuare una raccolta di toolbox sugli stili di vita e sui modelli di business clima-neutrali per creare un'unica toolbox alpina, che comprenda un calcolatore online dell'impronta ecologica nelle Alpi o strumenti per sistemi di audit energetico a livello regionale;
- Porre in essere progetti pilota per promuovere stili di vita e modelli di business a bassa emissione di carbonio per verificarne l'accettazione e l'impatto degli incentivi e delle misure di supporto.

Turismo

Turismo come attività economica chiave e interfaccia per altri settori …

Il turismo è una delle maggiori fonti reddituali nelle Alpi; infatti, il 40% dei comuni dell'arco alpino registra un'attività turistica importante. Le destinazioni turistiche devono però affrontare nuove sfide: adeguare la loro offerta alla nuova domanda turistica di vacanze improntate alla neutralità climatica, e ottemperare alle nuove normative che concernono la legislazione in materia di energia e clima nei rispettivi quadri normativi regionali e nazionali. Queste trasformazioni, però, devono preliminarmente tenere in conto i potenziali impatti sul turismo causati dal cambiamento climatico, richiedendo quindi l'applicazione di strategie *smart* di diversificazione. Per affrontare queste molteplici sfide e garantire che lo sviluppo del turismo venga integrato nelle strategie di pianificazione territoriale, nei piani di gestione del rischio, nelle soluzioni per la tutela della natura è necessario un maggiore coordinamento delle strategie sul turismo e degli strumenti di pianificazione.

La recente pandemia da COVID-19 impone molte altre sfide alle località turistiche alpine, che devono allineare la loro offerta alle rispettive normative e alle misure restrittive. Ma tutto ciò porta con sé anche l'opportunità per ridisegnare le offerte relative al turismo individuale, con un accento particolare alle soluzioni rispettose dell'ambiente, spesso compatibili con un "approccio di distanziamento fisico", in grado di realizzare sinergie positive con le strategie climate proofing. Entrambe le cose (le ulteriori sfide e le potenziali opportunità) devono essere tenute in considerazione nell'approccio strategico a livello dell'intero arco alpino.

… richiede un maggiore coordinamento di strategie e di strumenti per gestire la trasformazione verso la neutralità climatica e la resilienza ai cambiamenti climatici…

La **Conferenza delle Alpi si impegna a sostenere lo sviluppo di una visione comune per un turismo alpino clima-neutrale e resiliente ai cambiamenti climatici.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per evitare effetti indesiderati di sbilanciamento tra le destinazioni turistiche, che potrebbero insorgere se le strategie e gli approcci per lo sviluppo del turismo non venissero allineati (offerte turistiche di stampo intensivo rispetto a offerte sostenibili/estensive);
- per garantire che la capacità trainante di alcune specifiche località turistiche non sia messa a dura prova, considerando i potenziali impatti del cambiamento climatico e
- per ottimizzare uno sviluppo complessivo delle attività turistiche che, partendo dal presupposto della decarbonizzazione, faccia leva sulla qualità.

Per sostenere la trasformazione del turismo nelle Alpi, la **Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Sviluppare una visione comune per un turismo sostenibile, compreso il coordinamento di approcci strategici per lo sviluppo di offerte turistiche clima-neutrali e resilienti ai cambiamenti climatici, di accordi su obiettivi e traguardi comuni sul clima nonché di tematiche di monitoraggio e di reporting;
- Considerare l'allineamento dei canali di finanziamento e le misure di incentivazione finanziaria per sostenere lo sviluppo di offerte turistiche nelle Alpi clima-neutrali e resilienti ai cambiamenti climatici;

- Sviluppare attività per sostenere la formazione e il capacity-building nel settore turistico alpino, tenendo in considerazione le restrizioni dovute alla pandemia da COVID-19.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le proprie forze per attuare Ie seguenti azioni, descritte in dettaglio nell'allegato:

- Individuare i fattori e gli indicatori di successo per un turismo alpino rispettoso del clima e resiliente ai cambiamenti climatici, sulla base delle migliori prassi e di un'analisi mirata delle soluzioni sostenibili e innovative;
  In considerazione della situazione di crisi generata dalla pandemia da COVID-19 e della "esplosione" in corso di attività ricreative all'aperto, le azioni collegate alle offerte turistiche riferibili alla natura considerata a 360° dovrebbero essere un punto focale per la ricerca (ad esempio, l'offerta turistica collegata all'uso della bicicletta);
- Colmare le lacune nei dati relativi agli impatti sul turismo nelle Alpi derivanti dal cambiamento climatico e diffonderli ai vari stakeholder;
- Coordinare le strategie turistiche a livello alpino per incentivare la trasformazione delle destinazioni turistiche;
- Allineare i canali di finanziamento per lo sviluppo di un turismo sostenibile e rispettoso del clima, basandosi su una valutazione degli attuali meccanismi di supporto finanziario e di specifiche sovvenzioni;
- Creare un quadro generale di reporting sul clima per le località turistiche alpine, che stabilisca le esigenze di rendicontazione e le metodiche di rilevazione che le destinazioni turistiche devono applicare, completate poi da un ulteriore processo di monitoraggio;
- Prevedere interventi di formazione e di capacity-building per tutti gli stakeholder coinvolti nel settore turistico, con lo scopo di rafforzare le conoscenze e le competenze per la trasformazione del comparto turistico e per l'acquisizione di sostegni finalizzati all'implementazione delle attività, così come già iniziato nel Piano d'azione.

I pericoli naturali non si arrestano alle frontiere nazionali o regionali…

Non vi è dubbio che le Alpi, per le loro caratteristiche, siano esposte ai pericoli naturali con intensità e portata diverse, comprendendo tra questi gli eventi locali, come valanghe, cadute di massi, rischi torrenziali, frane, ma anche grandi eventi come alluvioni o forti tempeste. Una popolazione tendenzialmente in crescita e una significativa presenza di beni e di insediamenti in aree esposte ai pericoli, senza dimenticare poi gli eventi estremi, tendono ad aggravare il rischio di pericolo naturale. Poiché queste minacce non si arrestano alle frontiere regionali o nazionali, occorre prevedere un'azione comune a livello alpino per far fronte agli impatti su vasta scala nonché a quelli potenzialmente transfrontalieri. Una particolare attenzione deve essere poi riservata alle aree di permafrost e agli eventuali rischi legati alla sua instabilità, nonché agli eventi alluvionali che avvengono su larga scala, con impatti su interi bacini idrografici e su foreste di protezione. Questi pericoli naturali hanno una grande potenzialità negativa: quella, cioè, di essere in grado di provocare impatti a livello transfrontaliero e di grandi proporzioni, colpendo sia gli insediamenti sia le infrastrutture essenziali nelle Alpi.

… e, per questo motivo, è necessario un approccio comune di gestione del rischio per affrontare i rischi transfrontalieri …

Basandosi su informazioni tratte dalla RSA7 "Governance del rischio nel contesto dei pericoli naturali", la **Conferenza delle Alpi fa sua la proposta di sviluppare un piano di gestione del rischio nell'arco alpino per affrontare i pericoli transfrontalieri con un approccio coordinato.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio a livello alpino, come l'individuazione di:

- esperienze che possano essere oggetto di un efficace confronto e, al tempo stesso, interfacce in grado di operare esclusivamente sulla base di un quadro coordinato per la raccolta e la presentazione di informazioni e dati, mettendo insieme quanto emerge dagli approcci di gestione del rischio a livello nazionale;
- sinergie sui rischi transfrontalieri, che contribuiscano a garantire efficaci ed efficienti sistemi coordinati di preallarme e di risposta in tutto l'arco alpino.

Per supportare l'elaborazione di un piano di gestione del rischio a livello alpino e garantire che questo si focalizzi sui pericoli transfrontalieri con potenziali impatti su vasta scala, la **Conferenza delle Alpi si impegna a sostenere le seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Sviluppare un piano di gestione dei rischi transfrontalieri valido per tutto l'arco alpino, compresa la definizione di metodi omogenei per il loro rilevamento e monitoraggio, di un solido coordinamento degli approcci in grado di affrontare i pericoli residuali e di una toolbox comune (comprensiva delle tecnologie innovative);
- Predisporre ulteriori interventi per sviluppare un sistema di monitoraggio del permafrost e dell'erosione a livello alpino, e per programmare azioni sulla prevenzione e sulla gestione delle alluvioni.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

- Sintetizzare la pianificazione della gestione dei pericoli naturali e la considerazione dei rischi transfrontalieri per ottenere maggiori informazioni su come questi ultimi vengono governati nei Paesi alpini;
- Effettuare una mappatura non solo degli hotspot delle infrastrutture essenziali e degli insediamenti umani in generale (con particolare riguardo a quelli collegati alla rete dei trasporti, dell'energia e delle comunicazioni), ma anche degli insediamenti e delle infrastrutture del settore sanitario;
- Predisporre un quadro comune per la gestione dei rischi transfrontalieri, che includa una comprensione collettiva del ciclo di gestione del rischio, metodi e standard comuni per il suo rilevamento e monitoraggio, nonché raccomandazioni e strumenti per misure preventive finalizzate ad affrontare i rischi transfrontalieri;
- Sviluppare un monitoraggio comune del permafrost, basato su un inventario completo relativo all'arco alpino, e una puntuale mappatura delle attività, delle stazioni e delle reti esistenti al riguardo, tenendo in considerazione il potenziale del rilevamento di dati e servizi da remoto.

Acqua

I sistemi idrici nelle Alpi sono fortemente interconnessi a livello transfrontaliero …

La gestione delle risorse idriche nelle Alpi deve affrontare nuove sfide dovute ai cambiamenti climatici: per questo, sono necessarie attività di adattamento e di mitigazione. Il cambiamento climatico eserciterà sulle risorse idriche alpine una pressione ancora più forte rispetto ad altre realtà, a seguito delle mutate modalità delle precipitazioni, del minore manto nevoso durante i mesi invernali e delle crescenti temperature: tutto ciò causerà situazioni eccezionali sia di mancanza d'acqua che di inondazioni, con la conseguente necessità di approntare valide soluzioni di adattamento. Allo stesso tempo, la gestione delle risorse idriche e la sua integrazione nei processi di pianificazione del territorio rappresentano elementi di mitigazione del cambiamento climatico, e richiedono dunque di essere coordinate a livello di bacino idrografico. Per di più, nelle Alpi, le acque superficiali e quelle faldifere sono estremamente interconnesse a livello transfrontaliero: una sfida ulteriore che richiede necessariamente un approccio comune.

I fiumi e i laghi alpini hanno peraltro un elevato valore ricreativo, molto apprezzato durante la crisi pandemica da COVID-19, che ha comportato specifiche misure restrittive in materia di spostamenti. Per questo motivo si potrebbero creare ulteriori opportunità di finanziamento per progetti di ripristino/rigenerazione delle acque.

… e richiedono un approccio alpino per una gestione dell'acqua "a prova di clima", compresa la predisposizione di un piano di gestione integrato per situazioni di siccità…

Sulla base delle informazioni emerse nella recente Conferenza sull'acqua di Annecy, organizzata dalla Presidenza francese nel febbraio 2020, la **Conferenza delle Alpi si impegna a supportare la creazione di un quadro di riferimento alpino per sistemi di gestione dell'acqua climate proofing e a sviluppare un approccio coordinato per affrontare le nuove sfide collegate a situazioni di siccità.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio alpino come

- l'attenzione transfrontaliera negli attuali piani di gestione dei bacini idrografici, anche per i fiumi più grandi, attualmente ancora insufficiente, ma che rappresenta il pre-requisito per stabilire reali sistemi di gestione dell'acqua a prova di clima;
- la gestione della siccità è una sfida relativamente recente nelle Alpi, che dovrà essere affrontata congiuntamente per poter considerare le necessità e le pressioni in ogni bacino idrografico, affinché possano essere evitati effetti indesiderati sia a monte che a valle.

Per sostenere dei sistemi di gestione dell'acqua a prova di clima e la creazione di una efficace gestione della siccità nelle Alpi, la **Conferenza delle Alpi si impegna a sostenere le seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Realizzare un quadro di riferimento a livello alpino per promuovere strumenti di pianificazione transfrontaliera e processi partecipativi, in grado di creare una cooperazione intersettoriale (livello amministrativo) e di integrare i principali gruppi di stakeholder all'interno di un bacino idrografico di riferimento al di là dei singoli processi nazionali dei relativi piani di gestione. In questo modo, verranno anche rafforzate la Direttiva Quadro sulle acque dell'Unione europea e altre importanti linee guida;
- Sviluppare un approccio comune per affrontare le situazioni di siccità nelle Alpi, tenendo in considerazione la disponibilità idrica nell'intero bacino idrografico. Tale approccio deve considerare le possibili esigenze e le potenziali pressioni provenienti da altri hotspot siccitosi

a valle, anche al di fuori del perimetro della Convenzione delle Alpi, nonché garantire che le misure di gestione della siccità siano in linea con la conservazione degli ecosistemi e dei loro rispettivi servizi.

…con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

Per supportare un quadro comune climate proofing dei sistemi di gestione dell'acqua:

- Individuare hotspot e mappare le attività di coordinamento in corso come punti di partenza per identificare bacini idrografici modello a livello alpino, dove una maggiore cooperazione tra Paesi vicini contribuirebbe a evitare conflitti tra i diversi interessi nell'uso dell'acqua;
- Promuovere progetti modello per una gestione integrata dell'acqua, a livello transfrontaliero e climate-proofing, al fine di aumentare la cooperazione transfrontaliera e regionale;
- Ampliare le strutture di governance per la gestione dei conflitti, basandosi su alleanze ampie ed efficaci finalizzate alla gestione dei conflitti legati all'acqua per i bacini idrografici modello in precedenza individuati.

Per sviluppare un approccio comune per la gestione della siccità:

- Realizzare una carta interattiva relativa agli hotspot esposti a rischio di siccità in scenari climatici diversi, basata su un metodo comune di soglie, definizione di scenari e sistemi di classificazione;
- Approntare un sistema di preallarme e piani emergenziali sulla siccità per rilevare tempestivamente situazioni siccitose e avviare adeguate misure;
- Individuare un quadro concettuale per mettere in atto misure infrastrutturali finalizzate a ridurre il consumo di acqua potabile per scopi diversi come: servizi igienici, irrigazione e innevamento artificiale.

Le strutture territoriali nelle Alpi, essendo molto specifiche, necessitano di approcci personalizzati...

A causa della scarsità delle aree destinate agli insediamenti permanenti, delle specifiche esigenze dei trasporti e della mobilità, nonché delle sfide demografiche, la pianificazione territoriale costituisce di per sé un importante campo politico intersettoriale. La pianificazione territoriale mira a conciliare in modo sostenibile le esigenze di settore, spesso in conflitto sulla destinazione d'uso del suolo, e a definire priorità per specifici suoi utilizzi, secondo determinate preminenze. Inoltre, la pianificazione territoriale ha altresì l'obiettivo di utilizzare le risorse tenendo in considerazione la mutevolezza delle condizioni. Il cambiamento climatico è una di queste e, a tal proposito, va rilevato come le Alpi registrino un ritmo più veloce ed un impatto maggiore da questo derivante rispetto a quanto non avvenga in altre regioni europee. Conseguentemente, supportare la transizione verso le Alpi clima-neutrali e resilienti ai cambiamenti climatici attribuisce ora un nuovo ruolo alla pianificazione territoriale, ossia quello di integrare gli interventi di adattamento e di mitigazione in tutte le attività collegate alla pianificazione territoriale, garantendo una perfetta base di partenza per le altre azioni di settore ed evitando effetti di confinamento rispetto allo sviluppo di insediamenti e di infrastrutture. Un quadro di riferimento comune a livello alpino, basato su una concezione di pianificazione territoriale "a prova di clima", potrà essere in grado di garantire parità di condizioni in tutta la regione alpina.

In aggiunta, poiché nella maggior parte dei Paesi alpini i Comuni giocano un ruolo fondamentale nello sviluppo del territorio e nell'implementazione degli obiettivi di pianificazione territoriale, occorre costruire un contesto valido per l'intero territorio alpino che abbia un approccio bottom-up, capace di sostenere e rendere operativo il livello comunale.

… da realizzare attraverso lo sviluppo di un ampio concetto alpino di pianificazione territoriale nel quadro dell'azione sul clima ...

La **Conferenza delle Alpi riconosce la necessità di sviluppare un concetto alpino di "Pianificazione territoriale" che sia "a prova di clima".**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per garantire che la pianificazione territoriale, intesa come interfaccia di altre attività settoriali, sia considerata nel quadro di un approccio comune per integrare così le nuove sfide legate alle politiche di mitigazione e adattamento;
- per assicurare che i quadri di riferimento della pianificazione territoriale incentivino altre attività ricomprese nel Piano d'azione.

Per sviluppare ulteriormente tale impostazione, la **Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino**:

- Effettuare una panoramica degli impatti derivanti dai cambiamenti climatici sul suolo o conseguenti al suo uso, come punto di partenza per un quadro di riferimento a livello alpino, sottolineando gli aspetti rilevanti per ulteriori azioni e per prossime sfide chiave;
- Sviluppare un approccio comune per la protezione del suolo, inteso come uno dei vettori determinanti per effettuare interventi di mitigazione (utilizzando dati armonizzati relativamente al consumo di suolo), un sondaggio sugli obiettivi per la sua tutela nei Paesi

alpini nonché un confronto sulle buone pratiche al fine di elaborare strategie espansive/riduttive;
- Fornire, ai Comuni della Convenzione delle Alpi, linee guida relative alla "Pianificazione territoriale per l'azione sul clima" così da acquisire raccomandazioni e spunti su come integrare le problematiche della mitigazione e dell'adattamento alle pratiche locali sulla pianificazione territoriale.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima…:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

- Raccogliere dati comuni sugli impatti derivanti dai cambiamenti climatici sull'uso o per l'uso del suolo, evidenziando in particolare quelli con rilevanza transfrontaliera (ad esempio: sulle infrastrutture, la produzione di energia e lo sviluppo degli insediamenti) ipotizzando diversi possibili scenari;
- Effettuare lo scambio di buone pratiche per strategie espansive/riduttive, incluso un sondaggio sugli obiettivi e sulle sfide della tutela del suolo, così come avvenuto nei Paesi alpini, e analizzandone le conseguenze relative alla loro attuazione;
- Incrementare la sensibilizzazione sul rapporto tra l'azione sul clima e la pianificazione territoriale, mettendo in risalto i vantaggi della mitigazione legati al contenimento dell'espansione;
- Fornire ai Comuni indicazioni finalizzate ad un uso sostenibile del suolo (ad esempio il climate proofing) e ad un adattamento basato sugli strumenti e sugli approcci al momento esistenti.

Il suolo alpino affronta molteplici sfide derivanti dai cambiamenti climatici…

Il suolo alpino non soltanto è estremamente vulnerabile ai cambiamenti climatici, ma subisce anche forti pressioni legate al suo uso, consumo e impermeabilizzazione. La protezione del suolo alpino è quindi cruciale per le azioni di mitigazione del cambiamento climatico, poiché soltanto un suolo in buone condizioni può immagazzinare umidità e carbonio. Nella regione alpina possiamo trovare molte tipologie di suolo ricche di carbonio, come le torbiere, le brughiere o le zone umide. Queste aree devono essere protette, sia in termini qualitativi che quantitativi, attraverso la riduzione delle pressioni derivanti dalla crescente domanda di spazio per la circolazione dei mezzi, l'edilizia abitativa, ragioni economiche, attività ricreative nonché per le pratiche agricole e forestali, ambiti questi che rappresentano una vera e propria minaccia alla tutela del suolo. Inoltre, la sua protezione è un prerequisito per l'attuazione di molte misure di adattamento, ad esempio nelle aree insediative per evitare gli effetti delle "isole di calore" o per rafforzare la gestione delle inondazioni attraverso la creazione di zone di contenimento delle acque.

Queste sfide non riguardano esclusivamente un singolo Stato alpino, ma sono transfrontaliere e costituiscono quindi un'emergenza comune. Occorre allora acquisire maggiori conoscenze sul suolo alpino e disporre di un quadro comune per tutelarlo in quanto serbatoio di carbonio, mantenendo un confronto tra i soggetti alpini coinvolti.

… e richiede un quadro comune per preservarne la quantità e la qualità…

La **Conferenza delle Alpi riconosce la necessità di sviluppare un quadro di riferimento a livello alpino per preservare il suolo ricco di carbonio e di ridurne il consumo e l'impermeabilizzazione (quantità di suolo).**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per garantire che il suolo ricco di carbonio sia individuato mediante un approccio omogeneo a livello alpino e che ulteriori attività di conservazione siano finalizzate alla sua tutela;
- per sviluppare un approccio comune volto a ridurre il consumo di suolo, integrandolo nel concetto di pianificazione territoriale, così come proposto nel Piano d'azione sul clima e altre attività settoriali.

Per migliorare ulteriormente il quadro di riferimento a livello alpino per la tutela del suolo, la **Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino**:

- Realizzare un'indagine e una mappatura del suolo, basandosi su un sistema comune per la sua classificazione, al fine di fornire informazioni sulle tipologie di suolo ricche di carbonio e sull'esigenza di mettere in atto misure di preservazione. In particolare, occorrono maggiori conoscenze sulle tipologie di suolo in aree d'alta quota;
- Sviluppare un quadro comune per la conservazione del carbonio nel suolo, fornendo anche delle raccomandazioni per l'elaborazione di misure atte a preservarne e ad aumentarne la quantità presente nel suolo, per la protezione e/o il risanamento di torbiere, brughiere e zone umide, nonché approntare una campagna di maggiore sensibilizzazione a livello alpino;
- Condividere definizioni comuni per i termini di "consumo, impermeabilizzazione e riqualificazione di aree industriali dismesse" e cercare una comune intesa sul monitoraggio degli sviluppi in questi ambiti al fine di mettere a punto un quadro di riferimento comune per

la riqualificazione delle aree dismesse e per la riduzione del consumo di suolo, preservandone in tal modo la quantità;

- Stabilire un quadro di regolamentazione del sistema di incentivi e di esempi di buone pratiche per motivare gli sforzi al fine di evitare il consumo di suolo e per riqualificare maggiormente le aree industriali dismesse, agendo sulla base delle raccomandazioni sviluppate dalle reti alpine di pianificazione territoriale e di tutela del suolo. Le conoscenze ottenute grazie all'impiego di questi sistemi di incentivazione saranno integrate nelle linee guida per pianificare l'uso del suolo a livello comunale.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, così come descritte in dettaglio nell'allegato:

Per supportare la conservazione e il sequestro di carbonio nel suolo:

- Realizzare una mappatura e un sistema di classificazione del suolo a livello alpino, basandosi su un comune accordo relativo alle tipologie di suolo (in particolare quelle ricche di carbonio come le torbiere, le brughiere e le zone umide). Questo sistema di classificazione costituirà la base affinché gli stakeholder che si occupano di protezione del suolo possano intraprendere ulteriori iniziative;
- Organizzare una campagna di comunicazione sulla tutela del suolo per aumentare la consapevolezza dell'opinione pubblica sull'importanza della presenza del carbonio nel suolo;
- Sviluppare delle raccomandazioni sulle misure di compensazione, protezione e prevenzione allo scopo di conservare e ripristinare la quantità di carbonio nel suolo, riattivare le torbiere nonché supportare progetti pilota per attuare le suddette raccomandazioni.

Per definire un quadro comune al fine di evitare il consumo e l'impermeabilizzazione di suolo e avviare una riqualificazione delle aree industriali dismesse:

- Raggiungere una definizione comune per i termini di "consumo, impermeabilizzazione del suolo e riqualificazione delle aree dismesse" basandosi su una raccolta di dati esistenti relativi alla qualità del suolo e alle sue funzioni, compatibile con gli attuali dati statistici sull'uso del suolo nei Paesi alpini, al fine di ottenere un approccio condiviso sul monitoraggio del futuro consumo e riqualificazione delle aree dismesse;
- Avviare un'attività di coaching rivolta ai responsabili della pianificazione territoriale e ai decisori politici, promuovendo la comunicazione sull'importanza della pianificazione territoriale come strumento per la tutela del suolo, e sulla necessità di tenere in debita considerazione i dati sulla qualità del suolo e le funzioni della pianificazione territoriale;
- Presentare raccomandazioni a livello alpino per un sistema di incentivazione economica e le relative attività dimostrative;
- Predisporre linee guida per i piani d'uso del suolo a livello comunale e un'azione di comunicazione, che comprenda le strategie sia per la pianificazione territoriale che per le misure su scala ridotta volte alla riduzione dell'impermeabilizzazione, nonché una campagna di comunicazione per la diffusione di questi contenuti.

Gli agricoltori delle Alpi utilizzano metodi di decarbonizzazione dell'agricoltura …

L'agricoltura di montagna svolge un ruolo basilare nella **conservazione del paesaggio tradizionale alpino, delle razze animali e delle specie vegetali regionali, nonché nella preservazione della cultura locale, delle usanze e delle tecniche tradizionali**. I prodotti alimentari alpini sono spesso prodotti di nicchia di alta qualità, di grande richiamo per specifici mercati di consumo, e molte volte perfettamente integrati nelle **catene di valore locali**. I consumatori di tali prodotti sono spesso molto sensibili ai cambiamenti climatici e perciò dovrebbero anche essere disposti ad appoggiare ulteriori azioni a favore del clima adottate dagli agricoltori di montagna. L'agricoltura di montagna potrebbe fungere da "**laboratorio**" per **testare tecniche produttive e agricole a basse emissioni di gas serra** e per sviluppare le catene di valore locali. Simili approcci comporterebbero numerosi vantaggi ambientali, tra cui possiamo ricordare quello di un'agricoltura biologica che esercita un minor impatto ambientale rispetto alle tecniche tradizionali.

Una maggiore integrazione dei prodotti di montagna nelle catene di valore locali può sostenere anche altre attività nell'ambito del Piano d'azione sul clima, in particolare lo sviluppo di un'offerta turistica clima-neutrale. Inoltre, rafforzerebbe l'economia delle regioni alpine, le recenti esperienze della pandemia da COVID-19 hanno evidenziato gli effetti positivi di tali approcci rispetto ad una forte dipendenza dalle importazioni alimentari.

… attraverso il potenziamento delle tecniche di agricoltura biologica e clima neutrale, nonché delle catene di valore locali … …

La **Conferenza delle Alpi riconosce il potenziale dell'agricoltura di montagna per testare e dimostrare le tecniche di distribuzione e produzione clima-neutrali e sostiene ulteriori misure per aumentarne la diffusione.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per garantire che gli sforzi profusi superino i confini regionali e nazionali, dato che le catene di valore dei prodotti alimentari alpini hanno spesso un carattere transfrontaliero;
- per assicurare sinergie con altre attività di settore coordinate a livello alpino, in particolare la protezione del suolo, dell'acqua e del turismo.

Per sostenere ulteriormente le tecniche di agricoltura biologica e quelle clima-neutrali e per integrarle nelle catene di valore locali, la **Conferenza delle Alpi riconosce l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Promuovere i prodotti alpini locali e aumentare il valore aggiunto localmente mantenuto derivante dalla commercializzazione e dalla distribuzione di prodotti rispettosi del clima a livello locale e regionale. Tutte le attività promozionali saranno basate su una preliminare valutazione dell'impatto da CO_2 derivante dal maggiore uso di prodotti alpini e di catene di valore locali;

- Predisporre uno schema per un'agricoltura alpina a bassa, se non addirittura totalmente assente, emissione di CO_2, basato su un incremento significativo della percentuale di agricoltura alpina che si avvale di metodi di produzione biologica sostenibile, riducendo al contempo in modo significativo l'uso di prodotti chimici.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, così come proposte in dettaglio nell'allegato:

Per rafforzare ulteriormente lo sviluppo delle catene di valore locali per i prodotti alimentari delle Alpi:

- Predisporre degli indicatori destinati alle aziende agricole alpine sostenibili e rispettose del clima, da applicare a livello della singola azienda (organizzazione) oppure a livello del prodotto aziendale (bene);
- Definire una strategia regionale alpina per un'agricoltura rispettosa del clima, che comprenda programmi di sostegno e di marketing, iniziative commerciali, acquisti pubblici eco-compatibili, incentivazione della commercializzazione diretta dei prodotti agricoli alpini, ecc.
- Istituire una "Giornata europea dei prodotti alpini o di montagna" (EUDAMP) associata all'organizzazione di eventi e supportata da una puntuale campagna nell'intera Unione europea.

Per incentivare l'applicazione di tecniche agricole rispettose del clima:

- Predisporre un inventario dell'agricoltura biologica nelle Alpi e degli scenari conseguenti alla sua introduzione, che comprenda anche tecniche di gestione e di informazione, nonché il potenziale di riduzione dei gas serra e di altri impatti sull'ambiente;
- Individuare tecniche di gestione innovative ed evidenziarne i risultati nel quadro di interventi pilota per testarle in quanto capaci di supportare, con costi ragionevoli, la transizione verso un ricorso maggiore all'agricoltura biologica nelle Alpi;
- Varare politiche di supporto a favore di una transizione verso una produzione agricola biologica nelle Alpi, compresa la realizzazione di un inventario delle attuali iniziative politiche nella regione e, su questa base, sviluppare specifiche raccomandazioni per ulteriori interventi atti ad aumentare la percentuale del ricorso all'agricoltura biologica.

Le foreste possono svolgere numerose funzioni utili per le Alpi clima-neutrali e resilienti ai cambiamenti climatici …

Le foreste alpine giocano un ruolo chiave nelle strategie di mitigazione e in quelle di adattamento. I cambiamenti climatici fanno sì che le foreste montane siano esposte a rischi di maggiore portata, derivanti da periodi di siccità e da eventi estremi, quali raffiche di vento e incendi boschivi. Anche gli alberi indeboliti diventano più vulnerabili alle malattie e ai parassiti. D'altro canto, il manto forestale sta crescendo nelle Alpi proprio per l'abbandono di aree coltivate e per l'aumento delle temperature. Le foreste alpine agiscono come depositi di carbonio, forniscono legname che può essere impiegato sia nel settore edilizio che come fonte di energia rinnovabile, e, inoltre, sono parte di un approccio all'adattamento basato su un ecosistema, che funge da barriera naturale per proteggere gli insediamenti e le infrastrutture dai pericoli naturali.

Per garantire che le funzioni di protezione e di mitigazione delle foreste montane siano pienamente utilizzate, occorreranno tecniche di gestione mirate e specifiche.

Per sfruttare le opportunità legate alla Green Recovery, le attività che richiedono mano d'opera e che sostengono la conversione delle foreste dovrebbero rientrare all'interno di una strategia a breve termine, ad esempio fornendo opportunità di viaggio e di lavoro a favore di studenti e lavoratori con contratti a termine, ecc.

… ma solo nella misura in cui saranno accelerate le tecniche di gestione e di conversione verso foreste più resilienti e vicine alla natura …

La **Conferenza delle Alpi riconosce l'importante ruolo delle foreste montane affinché si affermi la visione delle Alpi climaneutrali e resilienti ai cambiamenti climatici. In particolare, promuove il coordinamento delle tecniche di gestione per sfruttare appieno il potenziale delle foreste montane, sostenendone la conversione.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per assicurarsi che gli approcci basati sull'attuale condizione della natura siano applicati in tutte le Alpi, affinché venga fatto un uso completo dei servizi ecosistemici derivanti dalle foreste montane;
- per garantire che le foreste montane in tutte le Alpi siano gestite all'interno di un contesto comune, sostenendo anche altre attività di settore.

Per rafforzare ulteriormente una gestione ottimizzata delle foreste montane, la **Conferenza delle Alpi riconosce in particolare l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Sviluppare e applicare delle "linee guida alpine" per la conversione delle foreste verso ecosistemi forestali più resilienti e vicini alla natura, basandosi su un approccio che coinvolga i soggetti interessati e considerando anche le altre attività settoriali rientranti nel Piano d'azione sul clima;
- Potenziare lo scambio di conoscenze sulle foreste montane, intese come una protezione contro i pericoli naturali;

- Incrementare la catena di valore regionale del legno nel quadro dell'economia circolare e della bio-economia.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima…

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

- Definire scenari di sviluppo delle foreste a seguito dei cambiamenti climatici nelle Alpi, compresa la condivisione di informazioni sui tipi di foreste (specie) e sulla loro età.
- Stabilire linee guida per la conversione delle foreste alpine, avvalendosi degli studi sullo scenario forestale, compresi esempi concreti e indirizzi sulle tecniche di gestione;
- Sperimentare gli incentivi finanziari nelle aree pilota per fornire un sostegno finanziario finalizzato a realizzare foreste resilienti nell'intero arco alpino;
- Implementare le catene di valore regionali del legname nelle regioni alpine.

Gli ecosistemi alpini sono un hotspot globale di biodiversità …

L'area alpina presenta un ampio ventaglio di paesaggi naturali e culturali particolari, di grandissima importanza per le specie faunistiche e floristiche in pericolo: tali specie devono affrontare non solo gli impatti derivanti dai cambiamenti climatici ma anche quelli relativi agli usi agricoli ed allo sviluppo delle infrastrutture e dell'urbanizzazione, che richiedono interventi puntuali, compreso il ripristino di elementi culturali e naturali, biotopi ed ecosistemi. Poiché le alterazioni climatiche comportano cambiamenti di specie, di habitat e di processi ecologici, la connettività ecologica delle aree protette e di altre zone di conservazione gioca quindi un ruolo fondamentale per assicurare la biodiversità e i servizi ecosistemici nella regione alpina. Inoltre, le dimensioni e le zone-cuscinetto delle aree protette devono aumentare per migliorare la resilienza degli ecosistemi e della biodiversità rispetto alle nuove sfide derivanti dai cambiamenti climatici. L'ulteriore sviluppo delle infrastrutture verdi e blu può supportare tutti questi elementi di gestione della biodiversità e degli ecosistemi resilienti al clima.

La pandemia da COVID-19 ha ben evidenziato che ecosistemi in buono stato, che funzionano e rispettano la biodiversità, sono fondamentali per la salute dell'essere umano: vi sono infatti collegamenti stretti tra la stabilità ecosistemica, l'ambiente, il mantenimento di habitat intatti e la salute umana, comprese le malattie da zoonosi.

… ma sono estremamente sensibili alle alterazioni, e quindi richiedono un'attenta gestione per essere resilienti e poter mantenere i loro servizi …

La **Conferenza delle Alpi riconosce l'importanza dei paesaggi culturali e naturali e l'alto valore dei servizi ecosistemici per l'area alpina, facendo suo lo sviluppo di un approccio gestionale comune per assicurare queste funzionalità in una situazione di cambiamenti climatici.**

La Conferenza delle Alpi riconosce l'elevato valore aggiunto di un approccio coordinato a livello alpino

- per garantire che il territorio alpino rimanga permeabile e vivibile per tutte le sue specie, proteggendo e gestendo gli ecosistemi e i paesaggi vulnerabili;
- per rafforzare la cooperazione transfrontaliera in materia di connettività ecologica, anche tra le Alpi e le zone periferiche e le altre regioni di montagna.

Per sostenere ulteriormente la definizione di un approccio gestionale coordinato per gli ecosistemi alpini e i paesaggi, oltre a rafforzare la connettività ecologica, la **Conferenza delle Alpi riconosce in particolare l'importanza delle seguenti azioni, come proposte dal Comitato consultivo sul clima alpino:**

- Sviluppare raccomandazioni per la pianificazione, la tutela, il ripristino e la gestione di particolari paesaggi alpini vulnerabili, attraverso l'applicazione di approcci basati sugli ecosistemi. Dette raccomandazioni dovrebbero essere la chiave per elaborare un inventario esaustivo dei paesaggi vulnerabili (paesaggi ed ecosistemi specifici delle Alpi), delle aree naturali (wilderness), nonché della distribuzione e della presenza di specie aliene invasive per conseguire una comune comprensione circa la necessità di agire;
- Definire un contesto comune per la gestione delle specie invasive (neobiota);

- Curare la preparazione di un "piano di gestione del cambiamento climatico" per le aree protette e le altre zone di conservazione, comprendenti sia la mitigazione che l'adattamento, garantendo al contempo il loro inserimento tra gli strumenti della pianificazione territoriale;
- Supportare il confronto fra stakeholder (aree protette e altre zone di conservazione) favorendo l'organizzazione di incontri periodici.

… con i seguenti step di attuazione nel quadro del Piano d'azione sul clima:

La Conferenza delle Alpi invita le Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori e gli altri soggetti interessati a unire le forze per attuare le seguenti azioni, descritte in dettaglio nell'allegato:

Tutelare e gestire specifici ecosistemi e paesaggi vulnerabili nelle Alpi

- Censire i paesaggi, le riserve naturali e gli ecosistemi nelle Alpi, nonché i servizi ecosistemici offerti, come base per tutte le ulteriori attività;
- Raccogliere dati sulle specie alloctone invasive presenti nella regione alpina, compresa una mappatura della distribuzione di neobiota;
- Prevedere raccomandazioni sulla conservazione e sulla gestione di specifici paesaggi alpini per migliorarne la pianificazione, la gestione, il ripristino e la salvaguardia;
- Monitorare l'attuazione delle normative esistenti nelle regioni alpine, compresa l'implementazione del Regolamento UE 1143/2014 sulla prevenzione e la gestione dell'introduzione e della diffusione di specie esotiche invasive, del Programma dell'UNESCO "L'uomo e la biosfera", della Convenzione di Berna sulla Conservazione della vita selvatica e degli habitat naturali, delle Direttive dell'Unione europea "Habitat" e "Uccelli", nonché delle strategie e dei report nel quadro della Convenzione sulla Diversità Biologica (CDB).

Sviluppare ulteriormente la connettività ecologica nelle Alpi focalizzandosi sugli impatti del clima:

- Approntare una definizione e un inventario di connettività ecologica nell'area alpina (ponendo l'accento sulle zone transfrontaliere), comprese le aree protette e quelle di conservazione, nonché le rispettive definizioni;
- Creare una rete di stakeholder e organizzare incontri periodici, basati sulle iniziative esistenti, al fine di facilitare il confronto e la cooperazione tra i gestori, nel quadro della cooperazione transfrontaliera;
- Potenziare gli aspetti della mitigazione e dell'adattamento nei piani di gestione, anche attraverso l'implementazione di soluzioni naturali e l'individuazione di nuove aree protette, ad esempio le riserve della biosfera UNESCO, per tutelare le specie, gli habitat e i processi ecologici che, a seguito delle variazioni causate dai cambiamenti climatici, non troverebbero più spazio.

3. Azioni trasversali

L'inserimento del Piano d'azione sul clima nella più ampia legislazione sul clima

Il Piano d'azione sul clima 2.0 è volto a supportare l'azione sul clima a livello europeo, nazionale e regionale ed è focalizzato su attività non solo all'interno della regione alpina, bensì anche in aree che abbiano specifiche caratteristiche alpine e, per questo motivo, necessitano inoltre di un sostegno dalla più ampia legislazione in materia di clima. Infatti, gli interventi a livello alpino potranno rivelarsi pienamente efficaci solamente se le politiche generali e il quadro normativo per la mitigazione e l'adattamento nei Paesi alpini perseguiranno un approccio ambizioso. Inoltre, saranno necessari incentivi finanziari per sostenere la decarbonizzazione e le soluzioni efficienti di adattamento, nonché i disinvestimenti dalle tecnologie, dai processi e dagli stili di vita ad alta intensità di carbonio. Raggiungere gli obiettivi del Sistema alpino di obiettivi per il clima 2050 (ad esempio, Alpi resilienti ai cambiamenti climatici e clima-neutrali) sarà possibile solamente se i prezzi terranno conto dei costi sociali e di quelli ambientali, e se gli ulteriori incentivi consentiranno un forte balzo in avanti degli investimenti sull'azione per il clima.

La Conferenza delle Alpi sostiene quindi le seguenti politiche chiave per incentivare e finanziare le attività, così come proposte nel Piano d'azione sul clima:

- Stabilire un prezzo elevato della CO_2, fissato nel quadro della legislazione nazionale o all'interno di un più ampio sistema europeo di scambio di quote di emissioni. Questo consente di realizzare un approccio basato sul mercato, al fine di migliorare la competitività delle tecnologie di efficienza energetica e di neutralità climatica. I Paesi alpini dovrebbero lavorare per un approccio comune in tal senso, dando così un segnale per un più alto prezzo della CO_2.
- Tracciare la strada per una Riforma Green del Bilancio, che trasferisca le imposte dal mondo del lavoro a quello dell'ambiente. Questo consentirà di fissare ulteriori incentivi economici per intraprendere l'ambizioso Piano sul clima. Diverse esperienze di Riforma Green del Bilancio, portate avanti nella regione alpina, hanno avuto grande successo, e la Conferenza delle Alpi è a favore di ulteriori scambi e di un maggiore coordinamento, attraverso la creazione di sinergie con il proprio Piano d'azione per l'economia green.
- Considerare il Finanziamento Green come logica fondamentale, alla base del prossimo periodo di programmazione delle rilevanti azioni di investimento e di finanziamento dell'Unione europea. La Conferenza delle Alpi, quindi, sostiene in generale e appieno l'approccio del Green Deal dell'Unione e accoglie con favore il nuovo orientamento proposto relativo al Programma Spazio Alpino 2021-2027, che si focalizza sull'azione per il clima e su altre questioni ambientali.
- Misurare il benessere alpino attraverso la definizione di un set di indicatori che vadano al di là del P.I.L.
- Prevedere programmi di rilancio per affrontare le conseguenze economiche della pandemia da COVID-19, che dovrebbero seguire questo stesso principio, e adottare un approccio di Rilancio Green. Occorre garantire che i Piani di Rilancio e di Resilienza Nazionali sfruttino al massimo le loro disponibilità di spesa collegate al clima e utilizzino questa opportunità per accelerare lo sviluppo tecnologico clima-neutrale e per adottare soluzioni di adattamento basate sulla natura.

Attività trasversali del Comitato consultivo sul clima alpino (ACB)

Il Comitato consultivo sul clima alpino svolge un ruolo cruciale nel sostenere e guidare ulteriormente l'attuazione del Piano d'azione sul clima. Per tale motivo, sosterrà i gruppi che devono curarne

l'attuazione e che hanno assunto un preciso impegno in tal senso, questo sarà il suo compito chiave nei prossimi anni. Attraverso la stretta interazione tra i gruppi responsabili dell'implementazione del piano e il Comitato consultivo sul clima alpino, con i suoi vari rappresentanti nazionali, sarà garantito che le attività poste in essere creino sinergie con quelle a livello nazionale, e che i nuovi sviluppi realizzati a livello nazionale siano presi in carico dai gruppi responsabili del processo attuativo. Inoltre, il Comitato consultivo sul clima alpino svilupperà ulteriormente le conoscenze, base imprescindibile per guidare le attività attuative, e agirà ricorrendo ad alcune azioni trasversali:

- Continuerà ad applicare l'approccio attualmente in uso, che consiste nell'evidenziare azioni "di richiamo", ad esempio attraverso il sostegno e la promozione di un festival del clima dell'arco alpino;
- In stretta collaborazione con le reti esistenti sotto l'egida della Convenzione delle Alpi, si concentrerà, inoltre, sul rafforzamento delle azioni dei Comuni, riconoscendo che tale livello costituisce l'interfaccia chiave per l'implementazione di azioni efficaci per il clima e per consentire l'interazione tra i vari soggetti responsabili della loro attuazione;
- Riconosce che solide basi finanziarie costituiscono la chiave per stabilire partenariati di successo nel quadro del processo attuativo. Lo stesso Comitato supporterà quindi l'individuazione di nuove fonti finanziarie per l'attuazione del Sistema alpino di obiettivi per il clima 2050, includendo anche opzioni di finanziamento innovative. La Conferenza delle Alpi invita le Parti contraenti a offrire opportunità di finanziamento relative all'attuazione del Piano d'azione sul clima 2.0;
- Aggiornerà costantemente la sua relazione di inventario su basi concrete, al fine di orientare ulteriori azioni e decisioni, basate sull'evidenza, e mantenere traccia degli sviluppi dello stato dell'arte. I risultati saranno comunicati alla Conferenza delle Alpi e ai gruppi responsabili dell'attuazione del Piano per favorire uno sviluppo dinamico di ulteriori attività;
- Rafforzerà la collaborazione con altre iniziative/piattaforme/contesti regionali e con le rispettive Istituzioni, in particolare con quelle delle regioni vicine e di montagna, al fine di creare sinergie e rendere così possibili un apprendimento e uno scambio di conoscenze.

Durante i suoi lavori, il Comitato consultivo terrà conto dei contenuti del Piano d'Azione per l'Economia Verde rispetto alle suddette attività trasversali.

Attività di comunicazione

Il Comitato consultivo sul clima alpino (ACB) invita a costituire dei forti partenariati nel quadro del Piano d'azione sul clima nelle Alpi.
L'attuazione del Sistema alpino di Obiettivi per il clima 2050 potrà avere successo solo se adeguatamente supportata dai rispettivi stakeholder pubblici e privati. Questo supporto richiede un ampio lavoro di comunicazione per meglio informare i vari soggetti sulle attività del Comitato sul clima alpino e sul loro coinvolgimento nelle attività di monitoraggio.

Un obiettivo del Comitato consultivo è quello di comunicare a gruppi target. A tal fine, sono stati individuati:

- Pubbliche amministrazioni
- Decisori politici
- Settore privato
- Comunità scientifiche
- Media
- Educatori
- Giovani

Su queste basi, il Comitato consultivo sul clima alpino individua due gruppi target generali:

- Il primo gruppo target è chiamato "comunicatori della Convenzione delle Alpi", ed è composto dalla rete esistente della Convenzione delle Alpi, con le sue Parti contraenti, i Gruppi di lavoro tematici, gli Osservatori, il Segretariato permanente della Convenzione delle Alpi, ecc.
- Il secondo gruppo target è chiamato "pubblico più vasto".

Entrambi i gruppi target sono composti da alcuni stakeholder presenti nell'elenco così come in precedenza individuato (differiscono in materia di conoscenza della Convenzione delle Alpi e del lavoro del Comitato consultivo sul clima alpino). Lo scopo delle attività di comunicazione del Comitato consultivo è quello di espandere la rete, per raggiungere così la Pubblica amministrazione, i decisori politici, le comunità scientifiche, i media, gli educatori e i giovani, che non hanno familiarità con la Convenzione delle Alpi o con il Comitato consultivo sul clima alpino.

Una volta esperite con successo, tali attività di comunicazione permetteranno, da un lato, di aumentare il numero di implementatori/gruppi di attuazione, e, dall'altro, di incrementare il numero di persone capaci di rispondere alle seguenti domande: *cosa significano il Sistema alpino di obiettivi per il clima 2050 e i suoi percorsi attuativi per la vita, gli stili di vita, i modelli di consumo e i cambiamenti comportamentali nelle Alpi 2050? E io come posso contribuirvi?*

Il Comitato consultivo per il clima alpino (ACB) deve avvalersi di altri soggetti per raggiungere e coinvolgere "un pubblico più vasto". Sembra quindi essere fondamentale poter disporre di un ulteriore programma di comunicazione. A tal proposito, il Comitato consultivo si focalizza su questi tre slogan:

- "*Fallo bene e parlane*"
  Il Comitato consultivo sul clima ha sviluppato il Sistema alpino di Obiettivi per il clima 2050, i percorsi per la sua attuazione e il Piano d'azione sul clima: questi prodotti e i loro contenuti devono essere capillarmente diffusi.
- "*Non reinventare la ruota. Lascia che gli altri parlino per te*"
  Invece di ideare una nuova e completa strategia di comunicazione, il Comitato consultivo sul clima alpino ritiene che rivesta un maggiore valore aggiunto applicare gli attuali strumenti comunicativi, promuovendo una comunicazione di per sé puntuale e ampia, capace di trasmettere adeguatamente i suoi messaggi. La ragione è ovvia: il Comitato consultivo sul clima alpino non sarà in condizione di poter implementare da solo il Sistema alpino di obiettivi per il clima 2050, ma avrà bisogno del secondo gruppo target e dipende in linea di massima dai canali di comunicazione del primo gruppo target. Di conseguenza, Il Comitato consultivo sul clima alpino deve ricorrere ai canali di comunicazione del primo gruppo target.
- "*Collegati, connettiti e usa le sinergie*"
  Entra in contatto con coloro che stanno già comunicando per le Alpi e per gli obiettivi climatici nelle Alpi. Prepara informazioni dettagliate per loro, affinché possano essere maggiormente coinvolti e impegnati. In tale contesto, il Comitato consultivo sul clima alpino sta cercando testimonial e partner per l'implementazione del Sistema alpino di obiettivi per il clima 2050.

Per poter lavorare all'insegna di questi slogan, il Comitato consultivo sul clima alpino ha già proceduto a individuare i seguenti step:

- Approntare un nuovo design per i settori del Sistema alpino di obiettivi per il clima che rispecchi la *corporate identity* della Convenzione delle Alpi;
- Sviluppare il sito web www.alpineclimate2050.org;
- Organizzare un incontro-evento iniziale, per creare la squadra che si occuperà dell'attuazione del Sistema alpino di obiettivi per il clima 2050;
- Supportare ALPACA, il Partenariato alpino per le azioni locali per il clima e, in particolare, le sue attività di comunicazione sul clima.

Per il prossimo periodo di lavoro sono previsti i seguenti passaggi e progetti strategici:

- Rafforzare ulteriormente il nuovo sito web del Comitato consultivo sul clima alpino: www.alpineclimate2050.org, in particolare la Piattaforma della Community;
- Continuare le attività di incontro e di confronto mediante una periodica organizzazione di workshop per lavorare e fare squadra;
- Proseguire la cooperazione con gli Osservatori, ad esempio con ALPACA, il Partenariato alpino per le azioni locali per il clima, in particolare dopo i risultati della Conferenza sulla comunicazione climatica;
- Trovare dei comunicatori all'interno del primo gruppo target, allo scopo di raggiungere poi il secondo gruppo target. Gli Osservatori, così come gli altri soggetti del primo gruppo target, potrebbero soddisfare le aspettative relativamente al trasferimento di informazioni per i vari gruppi target. In una prima fase, occorre stilare un inventario per avere una chiara idea di *chi* raggiunge *chi*;
- Elaborare un quadro generale, indicando di quali informazioni il primo gruppo target abbia bisogno per raggiungere il secondo gruppo target, ad esempio informazioni sul lavoro del Comitato consultivo sul clima alpino per i siti web degli Osservatori, articoli per le newsletter, presentazioni per eventi, ecc.;
- Cooperare strettamente con il Segretariato permanente della Convenzione delle Alpi, che sta lavorando ad una nuova strategia di comunicazione generale. Questa è l'occasione per parlare con una sola voce della Convenzione delle Alpi dei suoi obiettivi e delle sue iniziative;
- Lavorare su particolari strumenti di comunicazione, come ad esempio, un gioco online (completando il gioco Climcards sviluppato nel 2019).

4. Attuazione del Piano d'azione sul clima 2.0

Le attività proposte nel Piano d'azione sul clima saranno realizzate con il sostegno dei team di attuazione che riuniscono gli stakeholder più importanti. I ruoli e le responsabilità nel processo attuativo saranno condivisi come di seguito indicato:

- Le Parti contraenti sono invitate a impegnarsi nello svolgimento di specifiche attività così come previste nel Piano d'azione, nonché a guidare, riunire e sostenere i gruppi responsabili per l'attuazione, fornendo, fra l'altro, risorse finanziarie;
- Le Presidenze della Convenzione delle Alpi sono invitate a focalizzarsi su determinate attività del Piano d'azione sul clima, affinché siano ulteriormente sviluppate e attuate durante il loro mandato;
- I Gruppi di lavoro tematici della Convenzione delle Alpi sono invitati a prevedere l'inserimento, nei loro mandati e programmi di lavoro per i prossimi anni, di attività (percorsi di attuazione o singole azioni), così come proposto nelle schede informative;
- Gli Osservatori, le autorità regionali, i Comuni, il settore privato, il mondo scientifico e la società civile sono invitati a svolgere un ruolo attivo nei progetti, che possa contribuire all'attuazione del Piano d'azione sul clima 2.0.

La Conferenza delle Alpi riconosce la funzione cruciale del Comitato consultivo sul clima alpino (ACB) nel dare un supporto ulteriore all'attuazione del Piano d'azione e, per questo motivo, ne conferma il mandato per il prossimo periodo di lavoro.

Il Comitato consultivo sul clima alpino (ACB), nel suo nuovo programma di lavoro, diventerà la piattaforma per i gruppi responsabili dell'attuazione:

- Manterrà e controllerà la Piattaforma della Community, già presente nel sito www.alpineclimate2050.org. Inoltre, stabilirà una singola community e un responsabile per ogni settore. Questi soggetti, tutti insieme, costituiranno il legame tra i partenariati di attuazione e il Comitato stesso, garantendo al contempo che tutte le attività siano funzionali alle finalità del Sistema alpino di obiettivi per il clima 2050;
- Sosterrà e promuoverà azioni di richiamo e attività trasversali, ad esempio un festival del clima in tutta la regione alpina;
- Continuerà a lavorare in sinergia con i Gruppi di lavoro tematici della Convenzione delle Alpi per facilitarne il contributo a favore dell'attuazione del Sistema alpino di obiettivi per il clima 2050 e il supporto ai gruppi responsabili dell'attuazione.
- Aggiornerà anche l'inventario, focalizzandosi, se necessario, su temi specifici i cui risultati saranno condivisi con i gruppi responsabili dell'attuazione, per garantire che un meccanismo di sinergie venga utilizzato durante tutto il processo.
- Monitorerà la generale attuazione dei percorsi e comunicherà periodicamente i risultati ottenuti. A questo riguardo, sarà sviluppato e applicato nel periodo successivo un sistema continuo di monitoraggio.
- Si impegnerà, insieme ad altre importanti istituzioni, strutture e gruppi di lavoro, a condividere le proprie esperienze al fine di dare il proprio contributo nello sviluppo di strategie di contrasto al cambiamento climatico in altre regioni montane.
- Traccerà i nuovi sviluppi, le tendenze emergenti a livello transnazionale e globale, proponendo al contempo gli aggiustamenti alle attività di implementazione che si dovessero rendere necessarie.

5. Annex - Implementation pathways of the Alpine Climate Target System 2050 (version: 02.10.2020)

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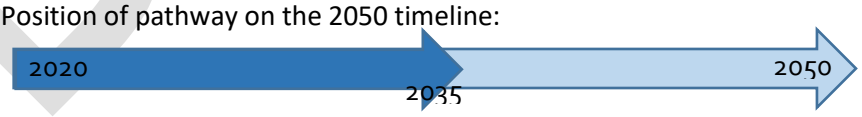
A1. Transport

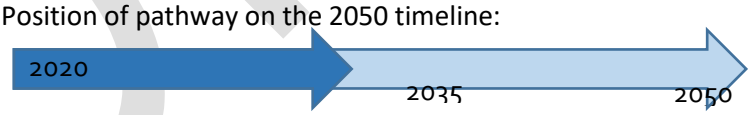
1.1 IP_Tr1: Strategies for decarbonisation of Alpine freight transport

Basic information	
Background and description of the pathway	*Freight transport is responsible for a large share of CO_2-emissions in the EU and volumes are expected to keep rising (e.g. due to the further increase of global freight transport flows, changing consumption patterns (online shopping)).* *The Alps as sensitive mountain environment are particularly sensitive to impacts of road freight transport. At the same time, the Alpine transit corridors connect the northern and southern parts of Europe and are key elements of the TEN-T network with its core corridors.* *Up to now, all efforts to reduce road freight transport were limited. Traffic volumes are still growing on all corridors, except in Switzerland. Ambitious efforts are thus still necessary. Solutions, which have not been harmonized, lead to traffic shifts between corridors. Therefore, these ambitious approaches should be developed at Alpine-wide level with the objective to reduce overall transport volumes across the Alps.*
Final output	• *Implementation of a policy framework for steering modal shift (e.g. Toll Plus, ACE)* • *Strategies/ recommendations on phasing-out internal combustion engine vehicles on the Alpine transit corridors* • *Knowledge hub*
Alpine specific character	*The Alps are at the crossroads of European transport systems but with a very high sensitivity. The large share of long-distance freight transport on the Alpine corridors increases the challenges for decarbonisation, alternative technologies are – up to now – rather focusing on short-/medium-distance freight vehicles.*
Link to mitigation and/or adaptation	Mitigation: *x* — Adaptation: *Focus is decarbonisation via modal shift and improvement of vehicle fleet.*
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2035* Starting point already available?: *yes*
Link to target system	• *Direct link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_Tr4: Decarbonised transport fleet* • *Indirect link: T_Tr1: Modal shift of Alpine freight transit; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy*
Sequence of implementation steps	

Starting point and links to stock-taking	• *Activities of WG Transport, e.g. analysis of innovative technologies for freight transport (stock-taking No. 34)* • *iMONITRAF!* • *EUSALP AG4* • *Zurich process* • *Different projects financed by Alpine Space Programme*
Preliminary step: Lobbying for Toll Plus **2020**	*The Eurovignette Directive defines the framework for road charging in Europe and includes provisions on external cost charging in general and in mountain areas in particular. The proposal for the revision of the Eurovignette (as agreed by the European Parliament in Oct 2018) will be discussed in the European Council throughout2020 and the German EU Presidency has the objective to come to a conclusion on the dossier. The discussion process on national level to prepare the Council meeting as well as the following trilogue discussions should be used for lobbying for an ambitious approach on road charging in mountain regions to set effective incentives for modal shift and decarbonisation of the vehicle fleet.*
Step 1: Support innovative technologies rail/CT **2021-2022**	*Based on existing activities of WG Transport and other networks, a further exchange on Best Practices and experiences with improving innovation in the rail and combined transport (CT) sector will be supported. The aim should be the development of an integrated Alpine-wide knowledge hub.*
Step 2a: Kick-start regional strategies for phasing-out of ICE vehicles **2022-2025**	*The ACB, in collaboration with WG Transport, will launch a discussion on the future role of internal combustion engine (ICE) vehicles in the Alps and on how a phase-out in the different segments of road freight transport can be achieved (regional/local logistics, long-distance transit traffic, medium-distance transport between Alpine centres). Experiences of these approaches are exchanged via the ACB and the WG Transport.*
Step 2b: **Support for implementing a Toll Plus system** **2022-2025**	*Based on the outcomes of the ongoing revision process of the Eurovignette Directive (see step 0) and the results of the next ministerial meeting of the Zurich process, the ACB will identify options for supporting implementation of Toll Plus at national level to set additional financial incentives for modal shift and decarbonisation of the vehicle fleet.*
Step 3: **Alpine Crossing Exchange** **2035**	*The cap-and-trade approach Alpine Crossing Exchange (ACE) is one potential instrument to limit overall CO_2-emissions of freight transport (via limitation of overall transport volumes on the Alpine corridors). Based on experiences with measure 2b, the ACB together with WG Transport will identify options on how to politically support the implementation of the ACE (based on ongoing discussions and windows-of-opportunity at EU level).* *The cap-and-trade logic of the ACE will support the financial incentives which are generated by Toll Plus in step 2b.*

Stakeholders needed for implementation	*National administrations* *Other networks dealing with freight transport in the Alps* *European Commission and Parliament (specifically for ACE)*	
Indicators for monitoring this pathway	• *Knowledge hub: implementation (yes/no) and number of users/year* • *Recommendations: Number of Alpine countries which have implemented the recommendations for phasing-out ICE vehicles* • *Toll Plus and ACE: qualitative description of networking/lobbying activities* • *Modal shift as general objective: development of modal shift on the Alpine transit corridors*	
Link to other pathways	• *Direct link: -* • *Indirect link: IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_E1: Set-up a network of regional energy coordinators; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB shares know-how on Toll Plus with national administrations, together with WG Transport.* • *ACB to support set-up of knowledge hub (step 1) or promotion/extension of existing hubs (e.g. EUSALP platform of knowledge)*
	Governance set-up	· *-*
	Twinning/know-how transfer	• *ACB can support exchange of experiences with strategies to phasing-out ICE vehicles (step 2a)*
	Outreach	• *Specific outreach activities to promote Toll Plus and ACE, targeted at EU and national level decision makers*
	Knowledge hub	• *Knowledge hub on innovative transport solutions (step 1) to be integrated with ACB hub.*
Integration in the ACB communication strategy	Content	*Information on new policy instruments and exchange of Best practices.*
	Tools	-

1.2 IP_Tr2: Developing the Alps into a model-region for reduced working mobility

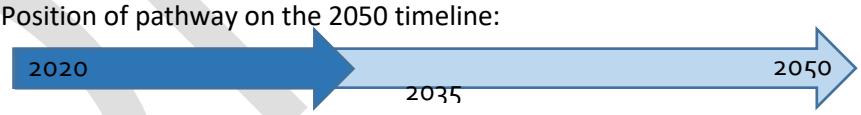
Basic information	
Background and description of the pathway	*Working mobility/commuting makes up a considerable share of passenger traffic in the Alps, leading to considerable environmental impacts. The specific challenge of cross-border commuter mobility makes it difficult to work towards effective solutions – national or regional approaches do not consider cross-border commuter flows.* *An Alpine-wide approach would thus be necessary to effectively reduce working mobility, including smart approaches to deal with cross-border mobility but also incentive systems to reduce overall commuter traffic (e.g. by implementing remote working options, teleworking, decentralized working spaces, etc.).*
Final output	• *Establishment of a network of regional mobility coordinators* • *Recommendations on Alpine-wide framework for reducing commuter mobility* • *Enabling the largest share of Alpine employees to (partly) make use of flexible work solutions*
Alpine specific character	*The large share of cross-border commuter traffic requires a common approach – purely national or regional approaches do often not consider this aspect. Also, the specific settlement patterns in the Alps and the concentration of jobs in the major economic centres leads to high commuter traffic, which often overlaps with tourism traffic during peak times.*
Link to mitigation and/or adaptation	Mitigation: *x* / Adaptation: *Focus is reduction of overall transport volume and shift to public transport.*
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2030* Starting point already available?: *yes*
Link to target system	• *Direct link to: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_MA3: Networks of CO_2-free municipalities* • *Indirect links to: T_MA_1: Municipalities as transition engines; T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Current ARPAF project. Cross-border mobility* • *PeMo project (stock-taking No. 53)*

Step 1: **Follow-up on activities of "Cross-border mobility" project and transfer to pilot regions** **2022-2025**	*In the frame of the ARPAF project "Cross-border mobility", several effective commuter cooperation models have already been identified. A toolbox has been developed and a first round of training courses was implemented. As the project was focused on some pilot areas, the experiences can be extended to other regions of the Alpine area (transfer).* *The pilot projects should also explore potentials for reducing overall commuter mobility, e.g. options for teleworking, decentralized workspaces, etc.*
Step 2a: **Set-up of network of regional mobility coordinators** **2025**	*Network of regional mobility coordinators (parallel to energy coordinators in Pathway "Set-up a pathway of regional energy coordinators") as interface between company level, municipalities, and regions will be set-up.*
Step 2b: **Pilot projects for location-flexible work solutions** **2025-2030**	*Based on experiences in step 1, several pilot projects with companies and municipalities are developed to test different approaches for location-flexible work solutions (e.g. experiments with teleworking/work floating approaches). This could include large companies which are major employers in a specific region (bottom-up) or municipalities/regions with a large share of outgoing commuter traffic (top-down).* • *Pilot projects and experiments could have different focuses: general working times, times during peak travel seasons, ensuring productivity during winter seasons/natural hazard events…)* • *Should make use of existing platforms or apps (e.g. for carpooling).* • *Should test financial incentives for teleworking models*
Step 3: **Recommendations for Alpine companies on decentralized work & living solutions** **2030**	*Based on first experiences of the regional mobility coordinators, a set of recommendations for Alpine companies to facilitate decentralized work&living solutions will be developed.*
Stakeholders needed for implementation	*Companies* *Municipalities (→ ALPACA network)* *Coworking office spaces/suppliers*
Indicators for monitoring this pathway	• *Pilots: number of follow-up pilot actions on commuter mobility* • *Trainings: Number of participants of training sessions* • *Regional mobility coordinators: Number of mobility coordinators installed* • *Recommendations: number of companies that apply the recommendations*

Link to other pathways	• *Direct link: IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_SP2: Spatial planning measures for reducing the need of individual car traffic* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_SP1: Alpine wide concept „Spatial planning for climate protection*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB can coordinate the extension of the toolbox (step 1), e.g. in coordination with WG Transport*
	Governance set-up	• *ACB in coordination with other relevant bodies of the AC launches set-up of regional mobility coordinators (link to Pathway "Set-up a network of regional energy coordinators")*
	Twinning/know-how transfer	• *Support to pilot activities, making use of expertise of ACB members and their networks.* • *Twinning approach for mobility coordinators*
	Outreach	• *Raise awareness on national level on activities implemented at local/regional level*
	Knowledge hub	• *Toolbox (step 1) to be implemented in ACB knowledge hub*
Integration in the ACB communication strategy	Content	*Information on pilots, trainings, best practices, etc.*
	Tools	*Toolbox for mobility managers*

1.3 IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport

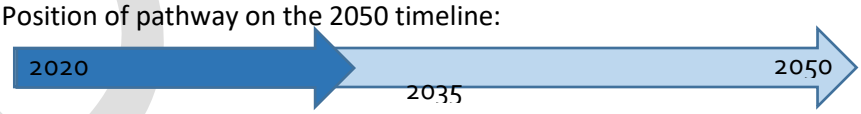
<table>
<tr><td colspan="2">Basic information</td></tr>
<tr><td>Background and description of the pathway</td><td>Reducing car-dependency by shifting to public transport solutions will be a core task for decarbonising passenger transport in the Alps. Activities and projects on modal shift for passengers however need to recognize the specific challenges in the Alps, especially related to cross-border mobility as well as mobility needs in remote regions. Also, the different needs of local citizens and tourists need to be considered, especially regarding easily accessible information. To ensure that public transport is in-line with the climate-neutral and climate-resilient Alps vision, public transport solutions should also, as far as possible, build on low-carbon technologies (e.g. electric buses, electrified or hydrogen railways).</td></tr>
<tr><td>Final output</td><td>• Implementation of an Alpine wide information and integrated ticketing system for public transport
• All public transport vehicles (road and rail) are powered by alternative fuels/electric mobility.</td></tr>
<tr><td>Alpine specific character</td><td>Cross-border aspect. Specific needs of tourists.

Specific challenges to provide user-friendly public transport solutions in remote areas.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td><table><tr><td>Mitigation</td><td>x</td><td>Adaptation</td><td></td></tr></table>Focus is reduction of overall transport volume and shift to public transport.</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
  <table><tr><td>Start of first implementation step</td><td>Now</td></tr><tr><td>End of last implementation step</td><td>2030</td></tr><tr><td>Starting point already available?</td><td>yes</td></tr></table></td></tr>
<tr><td>Link to target system</td><td>• Direct link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_Tr3: Reduced transport demand (passenger and freight); T_Tr4: Decarbonised transport fleet; T_Tou1: Car-free, attractive tourism traffic; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_MA3: Networks of CO_2-free municipalities
• Indirect link: T_E3: Decentralized, sustainable energy solutions for the Alps; T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport)</td></tr>
<tr><td colspan="2">Sequence of implementation steps</td></tr>
<tr><td>Starting point and link to stock-taking</td><td>• LINKING ALPS (new project Alpine Space Programme on developing an integrated multimodal information system)
• Mobility solutions in the Alps Database (stock-taking No. 33)</td></tr>
</table>

	• *AlpInfoNet project (stock-taking No. 44)* • *Alpine Pearls (stock-taking No. 47)* • *MELINDA - Mobility Ecosystem for Low-carbon and INnovative moDal shift in the Alps (stock-taking No. 81)* • *Yoalin: Youth Alpine Interrail* • *E-moticon and e-Smart projects (Alpine Space programme)* • *Several initiatives on national and regional level*
Step 1a: **Extension of youth Alpine Interrail tickets** **2021-2027**	*Youth Alpine Interrail is a project of the CIPRA Youth Council and CIPRA International, in cooperation with Eurail and promoted by the signatory States of the Alpine Convention. It enables 100 selected young people (ages 16-27) to travel sustainably across the Alps by means of public transport for 50-80 euros for one month in the summers of 2018 and 2019. This approach will be continued until a broader approach for a new mobility ticket in the Alps is proposed (see step 2b)*
Step 1b: **Completion and addition of Alpine-wide information & ticketing system** **2025**	*Based on the results of the AlpInfoNet as well as the Linking Alps project which has the objective to develop an integrated information system on public transport and alternative mobility solutions, there will be a need for further developing this system into a fully integrated information and ticketing system for the overall Alpine Space. Especially, the aspect of integrated ticketing will be a high value added to provide attractive alternative transport solutions.*
Step 2a: **Integration of information & ticketing system into local and regional mobility plans** **2027**	*With the help of the regional mobility coordinators (see transport pathway 2) the information and ticketing system will be integrated into local and regional mobility plans and communication strategies. This will also include a coordination of the information & ticketing system with parking space pricing, park-and-ride solutions, etc. The mobility coordinators will promote the information on the national and regional systems towards private stakeholders (e.g. links to companies or tourism destinations)*
Step 2b: **Support of new mobility tickets – further development of Alpine Interrail** **2027**	*To increase the acceptance and use of public transport, especially regarding cross-border mobility as well as tourism mobility, an Alpine-wide approach for new mobility tickets is explored: e.g. temporal flat-rate tickets for commuters or tourists, discounted multiple trip tickets which can be used in overall Alpine-wide public transport network, etc.* *These mobility tickets should be targeted at actual mobility needs and should avoid the creation of unwanted additional traffic volumes due to wrong incentive structures.*
Step 3: **Coordination of Alpine funding schemes for low-carbon public transport fleet**	*The public transport fleet in the Alps needs to build on best-available technologies, especially electric mobility solutions or alternative fuels. This however requires additional funding to support operators to renew their vehicle fleet. A coordination of funding schemes at regional and national level (e.g. regarding funding rates, requirements, etc.) could support the renewal of the vehicle fleet and develop the Alpine region into*

2030	*a model region for the take-up of low-carbon public transport fleet (e.g. testing electric buses under difficult topographical conditions).*	
Stakeholders needed for implementation	*Transport operators, transport associations/authorities* *Municipalities (→ ALPACA network)* *National authorities*	
Indicators for monitoring this pathway	• *Information system: number of regional transport information and ticketing systems which are integrated in the platform* • *Information system: number of users/number of search queries/number of bookings via the information system* • *Transport fleet: number of public transport vehicles/rolling stock which are changed into vehicles powered by alternative fuels/year*	
Link to other pathways	• *Direct link: IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism* • *Indirect link: IP_Tr1: Strategies for decarbonisation of Alpine freight transport; IP_E1: Set-up a network of regional energy coordinators; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB, together with WG Transport, EUSALP AG4 and other relevant networks identifies options for extending the platform (step 1) and for facilitating its further development.* • *ACB to support continuation of Youth Alpine Interrail.* • *ACB to kick-start discussion on Alpine mobility tickets, if possible in line with WG Transport and GEAP processes.*
	Governance set-up	• *ACB to identify stakeholders with private interest in setting up funding scheme*
	Twinning/know-how transfer	• *Twinning/know-how transfer will be ensured via regional mobility coordinators*
	Outreach	· -
	Knowledge hub	· -
Integration in the ACB communication strategy	Content	*Information on pilots, trainings, best practices etc.*
	Tools	*Information and ticketing system*

1.4 IP_Tr4: Developing the Alps into a model region for shared mobility

Basic information	
Background and description of the pathway	*Car-pooling and other alternative forms to reduce car dependency will play an important role for decarbonising Alpine transport but at the same time to ensure accessibility of all regions of the Alpine area (e.g. individual transport via Alpine-Uber)* *Car sharing, especially in tourism destinations, will play a crucial role in reducing the need for private vehicles and can support the modernization of the vehicle fleet.*
Final output	• *Implementation of an Alpine-wide information system which links existing Apps for shared mobility* • *Shared mobility solutions implemented in at least one Alpine municipality/tourism destination (integrated in label approach) in each Alpine state* • *Set-up of new shared mobility vehicles (bikes and cars) in every Alpine state through funding programme* • *New label/ network for tourism destinations which offer shared mobility options*
Alpine specific character	*High relevance of tourism transport in the Alps: many tourists still travel to the Alps by private car as they want to be flexible during their vacation. The availability of shared mobility solutions in their travel destination might be an alternative to bringing the private car.* *Offering shared mobility solutions in remote/densely populated areas brings along specific challenges (especially regarding costs).*
Link to mitigation and/or adaptation	Mitigation: *x* — Adaptation: *Focus is reduction of overall transport volume on the road*
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation steps: *Now* End of last implementation steps: *2030* Starting point already available?: *yes*
Link to target system	• *Direct link: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_Tou1: Car-free, attractive tourism traffic; T_MA3: Networks of CO_2-free municipalities* • *Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy*
Sequence of implementation steps	

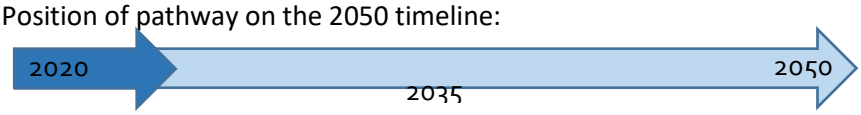
Starting point and link to stock-taking	*Measures in stock-taking that can serve as reference/basis:* • *Mobility solutions in the Alps Database (stock-taking No. 33)* • *Alpine Pearls (stock-taking No. 47* • *MELINDA - Mobility Ecosystem for Low-carbon and INnovative moDal shift in the Alps (stock-taking No. 81)* • *Several initiatives on national and regional level (e.g. stock-taking No. 97)*
Step 1: **Set-up of an Alpine-wide information system to link Apps for shared mobility solutions** **2021-2022**	*Set-up of an Alpine-wide information system which links existing Apps on shared mobility:* • *Bring together users/suppliers of carpooling (unpaid neighbour services as well as paid "Uber-like" solutions)* • *Information on availability of bike and car rentals* • *Pooling of logistic services/local deliveries*
Step 2a: **Develop a label and award for shared mobility solutions in the Alps** **2022-2025**	• *Based on the experiences of the Alpine Pearls network, either a new label or an extension of the Alpine Pearls label is established to promote and reward good solutions for shared mobility in the Alps (focus on both local citizens as well as tourists). In addition, an annual award is implemented to improve visibility of the issue (could be extension of Constructive Alps/ClimaHost Award).*
Step 2b: **Support to pilot projects** **2025-2030**	*Different elements of shared mobility will be tested in different pilot activities, e.g. regarding the potential of carpooling/logistics pooling in remote areas, the integration of shared mobility solutions into travel plans for tourists, the realisation of shared call for tenders by municipalities for car sharing/carpooling operators, the integration of cargo bikes into sharing solutions etc.*
Step 3: **Coordination of funding programmes for set-up of shared mobility stations** **2030**	*The set-up of shared mobility solutions (especially bike and car rentals) requires substantial funding. An Alpine-wide coordinated approach for funding schemes which set incentives for installing shared mobility infrastructures/vehicles could help. The coordinated approach should focus on innovative vehicle technologies to support the decarbonisation of the Alpine vehicle fleet.*
Stakeholders needed for implementation	*Municipalities (→ ALPACA network)* *Tourism stakeholders* *National authorities*

Indicators for monitoring this pathway	• *Integration of Apps: number of services/offers which are linked by the info system; number of users, number of "bookings"* • *Label: number of tourism destinations that join the label* • *Pilots: number of pilots* • *Funding: number of funding system which are coordinated in the common approach*	
Link to other pathways	• *Direct link: IP_Tr2: Developing the Alps into a model-region for reduced working mobility; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models ; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams)* • *Indirect link: IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_NH3: Support measures to enhance individual risk precaution; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB supports set-up of information system to link existing Apps (step 1), leading role should however be taken over by a stakeholder with stronger roots in the mobility sector.*
	Governance set-up	• *ACB will kick-start discussion on label and award (step 2a), e.g. linked to Alpine Pearls network.* • *Identification of private stakeholders which are interested in setting up an investment framework*
	Twinning/know-how transfer	· -
	Outreach	· -
	Knowledge hub	*Information system on Mobility Apps can be linked to knowledge hub.*
Integration in the ACB communication strategy	Content	*Information on pilots, trainings, best practices, etc.*
	Tools	*Information system which links Apps on shared mobility* *Label and award*

A2. Energy

2.1 IP_E1: Set-up a network of regional energy coordinators

<table>
<tr><th colspan="2">Basic information</th></tr>
<tr><td>Background and description of the pathway</td><td>The municipal level is crucial for implementing effective climate change mitigation and adaptation solutions and is a key interface for incentivizing climate-friendly behaviour of the general public. However, decision makers at local level often have limited capacities to develop and implement sustainable energy action plans (with links to other sectors), to identify opportunities for funding investments, to join forces and use synergies with other stakeholders etc.

Regional energy coordinators have the potential to close this “implementation gap”, serving as knowledge gateway for decision makers at local level (technical and procedural advice, knowhow on funding opportunities, communication support. Regional energy coordinators shall also bring together the needs from different municipalities to develop joint solutions (bundling of activities). In many Alpine regions, regional and local energy agencies are playing this role with local authorities in their daily interactions.</td></tr>
<tr><td>Final output</td><td>• Regional energy coordinators are installed in the Alps, based on existing organizations such as local and regional energy agencies.
• The networking of all regional energy coordinators is institutionalized with regular exchanges and a platform for knowledge transfer (to be defined: expected number of network members)
• Implementation of pilot actions
• Establishment of an Alpine training programme for regional coordinators</td></tr>
<tr><td>Alpine specific character</td><td>The energy transition entails specific challenges in the Alps, e.g. regarding the development of renewable energy production in the sensitive Alpine environment or energy-efficiency solutions in areas with low-population density and the resilience of the energy system to climate change impacts. On the other hand, there are many small municipalities in the Alps which have limited resources for international exchange. An Alpine-wide network of regional energy coordinators would allow the exchange of relevant experiences and support the implementation of “Alpine-fit” mitigation and adaptation solutions.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td><table><tr><td>Mitigation</td><td>x</td><td>Adaptation</td><td>x</td></tr></table>
Adaptation should be integral part of network.</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

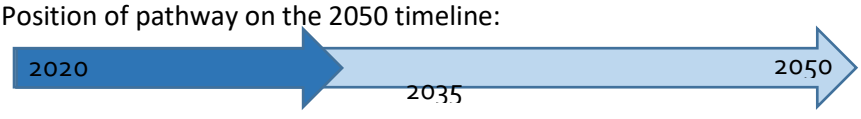
<table><tr><td>Start of first implementation step</td><td>Now</td></tr><tr><td>End of last implementation step</td><td>2025</td></tr></table></td></tr>
</table>

	Starting point already available?	*yes*
Link to target system	• *Direct link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement* • *Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_NH3: Individual risk precaution; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Agr1: Energy self-sufficiency of Alpine farms; T_MA1: Municipalities as transition engines; T_MA3: Networks of CO_2-free municipalities*	
Link to stock-taking	*Measures in stock-taking that can serve as reference/basis:* • *PEACE_Alps* • *Sinfonia* • *ALPACA*	
Sequence of implementation steps		
Starting point and link to stock-taking	• *Regional, national and European energy planning schemes ranging from the European Energy Award to national schemes (e.g. Austrian E5 programme, Italian ComuneClima, Energie Stadt Schweiz, Energie Kommunen Germany), to ICLEI (Local Governments for Sustainability) and the Covenant of Mayors and several EU level smart city initiatives as well as regional schemes like the Positive Energy Scheme (TEPOS) supported by the Rhône-Alpes Council* • *First elements of network of regional coordinators and related activities as established under the PEACE_Alps project (ASP 2015-18)* • *ALPACA (stock-taking No. 48)* • *EUSALP AG9: EUSALP Energy collaboration platform, Network for the Promotion of local Energy Management Systems (EMS), Report: Operationalising one-stop-shops on local level* • *Experiences of specific projects, e.g. SINFONIA (stock-taking No. 78)* • *Experiences with the set-up of networks at regional level (e.g. in Bavaria)*	
Step 1: Define strategy and Initialize operational network **2021-2022**	*Develop a strategy and set-up of an operational network of regional coordinators, if possible, in the whole Alpine area to:* • *Increase capacity of local decision makers* • *Ensure an effective knowledge transfer* • *Support implementation measures (RES, EE, communication)* • *Providing information on available European funds for supporting mitigation and adaptations policies at local level*	
Step 2a: Support & promote pilot actions **2022-2025**	*The network of regional energy coordinators should be used to promote and support pilot actions to develop decentralized energy solutions (also including smart grid solutions). This network should be based on existing organization when possible.*	
Step 2b: Alpine training programme for energy coordinators	*An Alpine training programme for regional energy coordinators would enable an instruction of regional coordinators and an exchange of experience between coordinators (could also include an "Erasmus"-type exchange for specific professions, e.g. mountain building professionals). All training courses of this programme shall be based on a common curricula for training and exchange.*	

Start: 2022		
Step 3: Diffusion of experiences **2025**	*Experiences of the first phase of the network should be enlarged to cover additional regions of the Alpine area (if not yet covered in step 1) or to reach out to regions in the broader perimeter:* • *Development of twinning approaches* • *Involvement of regional coordinators in EU projects to facilitate access to enable funding, etc.*	
Stakeholders needed for implementation	• *Existing regional energy coordinators and climate alliances* • *Network ALPACA for communication and coordination* • *Alliance in the Alps, Alpine Town of the Year Association* • *Decision makers at local and regional level* • *Existing energy planning schemes and initiatives (see list in "starting point")*	
Indicators for monitoring this pathway	• *Operational network: Number of additional regional coordinators that are installed in the regions of the Alps, description of value added of networking approach* • *Pilot actions: Number and type of pilot actions that are developed/initiated by regional coordinators* • *Alpine training programme: participants per year*	
Link to other pathways	• *Direct link: IP_E2: Enabling an Alpine-wide energy democracy; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises* • *Indirect link: IP_Tr1: Strategies for decarbonisation of Alpine freight transport; IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Set-up of network: The ACB together with EUSALP AG8 and AG9 can define a strategy to implement the network, including a work description/profile for regional energy coordinators.*
	Governance set-up	• *AC National Focal Points can call on national and regional authorities to set-up regional coordinators.*
	Twinning/know-how transfer	• *Bottom-up initiatives as developed within the network should be assisted through partners in ACB, e.g. members of the ACB support pilot projects of the regional coordinators.*

		• *Members of ACB or other Alpine Convention bodies can use contacts within their country/region to extend the approach.*
	Outreach	• *ACB can raise the visibility of impacts of regional coordinators at national level.*
	Knowledge hub	• *The knowledge hub of the ACB can be used for linking regional energy coordinators, e.g. via specific share point section.*
Integration in the ACB communication strategy	Content	*Energy coordinators provide: information on the network (towards potential members), on best practices (for replication), on trainings (towards potential participants)*
	Tools	-

2.2 IP_E2: Enabling an Alpine-wide energy democracy

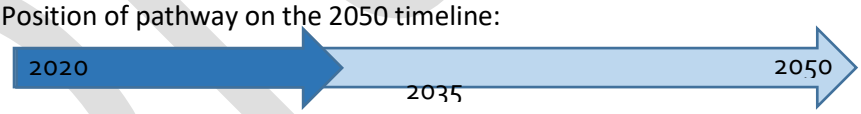
Basic information	
Background and description of the pathway	*With the energy transition, new stakeholders have the chance to enter the energy supply sector and to develop investment solutions for energy-efficiency and renewable energy projects. Energy communities are now defined in the Art. 16 of the Directive on the Internal Market for Electricity Directive on "Citizen Energy Communities" and in Art. 22 of the Directive on the promotion of the use of energy from renewable sources on "Renewable Energy Communities". Citizens get an opportunity to invest into small-scale energy-solutions and thus to shape the energy transition. Several types of financial participation have been developed on the market:* • *Energy cooperatives: citizens invest in local projects and are directly involved in developing and shaping these projects.*[3] • *Lending-based crowdfunding for RES or EE projects: citizens lend money for investment with fixed return rate.* • *Equity-based crowdfunding (crowdinvest): citizens invest in projects or start-ups and become shareholders. The returns depend on the market-success.* *To enable crowdfunding options, several funding platforms have already been set-up by private market players (e.g. BetterVest). These however include projects as developed by these market players, they do not have an Alpine-specific focus and do not enable Alpine citizens to search for investment opportunities in the Alps.*
Final output	• *Recommendations on innovative financial participation formats, with specific focus on Alpine-specific needs* • *Set-up of an Alpine-wide platform for marketing of investment options in the Alps and communication campaign* • *Implemented pilot projects (to be defined: specify number)*
Alpine specific character	*Energy crowdfunding in the Alps has the opportunity to create co-benefits in other fields of action.*
Link to mitigation and/or adaptation	Mitigation: x; Adaptation: x *Focus is on mitigation.* *If measures support the transition towards energy-autonomy, the pathway also has a strong link to adaptation.*
Implementation timeframe	Position of pathway on the 2050 timeline: 

[3] Energieagentur Rheinland-Pfalz GmbH (2016): „Geschäftsmodelle für Bürgerenergiegenossenschaften. Markterfassung und Zukunftsperspektiven.

	Start of first implementation step	*Now*
	End of last implementation step	*2030*
	Starting point already available?	*yes*
Link to target system	• *Direct link: T_E4: Alpine energy democracy/citizen involvement* • *Indirect link: T_MA1: Municipalities as transition engines; T_MA2: Climate action institutionalized in municipal action; T_MA3: Networks of CO_2-free municipalities*	
Sequence of implementation steps		
Starting point and link to stock-taking	*Green Economy Action Programme (stock-taking No. 9)* *Existing platforms and solutions that enable crowdfunding and participation in energy cooperatives*	
Step 1: **Analyse and adapt innovative financing solutions for RES and EE projects in the Alps** **2021-2022**	*Review of existing crowdfunding platforms and (green) financing solutions for RES and EE projects (e.g. public-private-(people) partnerships (PPP(P), cooperatives). Review of outputs from existing EU project dealing on the topic, such as Alpgrids (ASP project), Smart village (ASP project).* *→ Identify Alpine-specific challenges and needs to further support such solutions in the Alps.*	
Step 2: **Pilot projects with focus on Alpine-specific characteristics** **2022-2025**	*To test solutions for the specific challenges, a set of pilot projects is launched: e.g. to develop energy cooperatives with a link to preserving historic buildings, crowdfunding for investments linked to biogas use, etc.*	
Step 3a: **Recommendations for innovative Alpine energy financing** **2030**	*Recommendations that highlight co-benefits with other fields of action, especially benefits for Alpine ecosystems, mountain agriculture & forestry, etc. are developed*	
Step 3b: **Alpine-wide platform for investment solutions**	*Investment opportunities in the Alps (including energy cooperatives but also broader crowdfunding options) are integrated in an Alpine-wide platform.*	

2030		
Stakeholders needed for implementation	• *Market players involved in crowdfunding platforms* • *Local and regional administrations, private stakeholders, companies, sports clubs, tourism stakeholders, etc. to identify potential projects* • *Regional and national associations of cooperatives*	
Indicators for monitoring this pathway	• *Number of pilot projects developed* • *Number of new energy cooperatives developed in the Alps* • *Number of investment projects which are finalized on the Alpine-wide platform for energy crowdfunding*	
Link to other pathways	• *Direct link: IP_E1: Set-up a network of regional energy coordinators; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises* • *Indirect link: IP_Tr1: Strategies for decarbonisation of Alpine freight transport; IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_SP2: Spatial planning measures for reducing the need of individual car traffic ; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Review in step 1 and development of recommendations in step 3a, in line/coordination with GEAP process, EUSALP AG9 and other relevant stakeholders*
	Governance set-up	• *Identify relevant stakeholders with private interest to set-up a platform for investment solutions, mandate to these stakeholders to further develop the approach.*
	Twinning/know-how transfer	• *Indirect support of pilot projects, main support should be given by regional energy coordinators*
	Outreach	• *Increase visibility of pilot projects and on recommendations for Alpine energy crowdfunding.*
	Knowledge hub	• *Platform for investment solutions can be linked to knowledge hub.*
Integration in the ACB communication strategy	Contents	*Information on Best Practices/pilot projects, opportunities of crowdfunding solutions in general*
	Tools	*Online platform for investment solutions*

2.3 IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models

Basic information	
Background and description of the pathway	*The transition towards climate-neutral and climate-resilient Alps will require a change in behavioural patterns, lifestyles and business models, especially to support energy savings. To create an impact, all stakeholders and the civil society need to support the energy transition – but they are, in many cases, still unaware of the need for action or reluctant to change.* *Awareness raising campaigns and tools as well as a stronger involvement of the civil society in decision making processes, focusing on the specific challenges of the energy transition in the Alps, will create a broader awareness on the need for action and can trigger specific activities at private level.*
Final output	• *Compilation of toolboxes for Alpine households and SMEs to recognize their climate impact and to identify options for individual action.* • *Identification of 3-5 pilot regions/municipalities in each Alpine country which will test the toolbox.*
Alpine specific character	*Changing lifestyles and business models towards climate-neutrality brings along specific challenges in the Alps: longer travel distances, lower population densities with specific building structures, supply of regional products, etc.*
Link to mitigation and/or adaptation	Mitigation: *x* — Adaptation: *Focus is on mitigation.*
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2030* Starting point already available?: *yes*
Link to target system	• *Direct link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement* • *Indirect links: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_MA1: Municipalities as transition engines*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Citizens: 100max project (stock-taking No. 50)* • *All projects implemented by the Alpine mountaineering clubs (stock-taking No. 61-64)* • *SMEs: EUSALP AG9: Enhance Energy Efficiency in Alpine Small and Medium-Sized Enterprises, incl. CAESAR project*

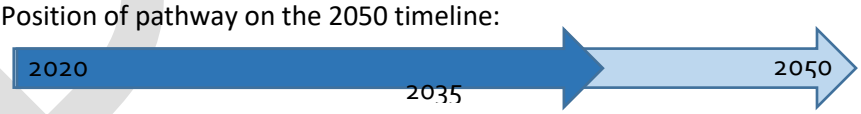
Step 1: **Compilation of toolboxes to support low-carbon/low-energy lifestyles and business models** **2021-2022**	*Existing tools and online platforms, are brought together into a compilation of Alpine toolboxes for low-energy lifestyles and business models. It could include:* • *Online calculator for Alpine carbon footprint* • *Calculator for product footprints, including comparison between Alpine and non-Alpine products* • *Tools for energy auditing schemes at regional level (e.g. based on results of the CEASEAR project (ARPAF))* • *Toolbox for measures*
Step 2: **Pilot projects on low carbon/low-energy lifestyles and business models** **2023-2030**	*In each Alpine country, 3-5 pilot regions/municipalities are identified to test the acceptance and impacts of support measures focusing on behavioural change and low-carbon/low-energy business models* • *(e.g. based on the experiences of the 100max project)*
Stakeholders needed for implementation	• *Local and regional administrations as well as SMEs for implementing pilot actions as well as for assessing needs for climate governance*
Indicators for monitoring this pathway	• *Number of specific tools implemented in the toolbox* • *Number of pilot projects implemented*
Link to other pathways	• *Direct link: IP_Tr2: Developing the Alps into a model-region for reduced working mobility; IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E2: Enabling an Alpine-wide energy democracy; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming* • *Indirect link: IP_Tr1: Strategies for decarbonisation of Alpine freight transport; IP_E1: Set-up a network of regional energy coordinators; IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_NH3: Support measures to enhance individual risk precaution; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions; IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_S2: Defining Alpine wide guidelines for minimised land take and sealing; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Fo2: Promoting Alpine forests as carbon sinks; IP_Fo4:*

	Promote an Alpine-wide integrated sustainable forest management approach	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB can kick-start the implementation of the toolbox in step 1a, which then should be further developed in an independent project (e.g. Alpine Space programme, LIFE climate, etc.).* • *Review of options to improve climate governance can be implemented by ACB or other relevant body of the AC.*
	Governance set-up	· -
	Twinning/know-how transfer	• *ACB members can support pilot activities. In general, ACB can facilitate that activities are linked and integrated with ALPACA activities.*
	Outreach	• *ACB can facilitate that results of pilots are transferred to other interested municipalities (e.g. via ALPACA).*
	Knowledge hub	· -
Integration in the ACB communication strategy	Contents	*Information on pilot activities, recommendations, process. etc.*
	Tools	*Contents of toolbox developed under measure 1a*

2.4 IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises

<table>
<tr><th colspan="2">Basic information</th></tr>
<tr><td>Background and description of the pathway</td><td>Local and regional administrations have a great potential to serve as forerunner and model to showcase potential actions to improve energy-efficiency and to install RES in small-scale public settings. Also, they can showcase different options for adapting buildings to climate change impacts, e.g. via increasing passive cooling systems, green roofs/green walls, etc.

Many people visit public buildings (schools, kindergarten, library, swimming pool, etc.) during their daily activities and can thus get in touch with Best Practices implemented in these buildings. Also, administrations can use further options to improve awareness on the transition towards climate-neutral and climate-resilient Alps, e.g. during information events, etc.</td></tr>
<tr><td>Final output</td><td>• Recommendations and minimum requirements for Alpine administrations to reduce CO_2-emissions on their premises and to adapt their building stock to climate change impacts
• Implementation of 50/50 projects aiming at mobilizing energy savings in public buildings or similar coordination projects in public buildings (especially schools, kindergartens, public sports facilities with many users)
• Energy retrofitting of the largest amount of public buildings in the Alps</td></tr>
<tr><td>Alpine specific character</td><td>Specific challenges to the energy transition in the Alps.

Alpine area lives up to the objective of becoming a model region.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td><table><tr><td>Mitigation</td><td>x</td><td>Adaptation</td><td>x</td></tr></table>Focus is on mitigation.</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

<table><tr><td>Start of first implementation step</td><td>Now</td></tr><tr><td>End of last implementation step</td><td>2040</td></tr><tr><td>Starting point already available?</td><td>yes</td></tr></table></td></tr>
<tr><td>Link to target system</td><td>• Direct link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement
• Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_MA1: Municipalities as transition engines</td></tr>
</table>

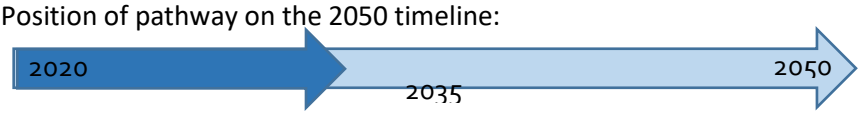
Sequence of implementation steps	
Starting point and link to stock-taking	• *Review of existing projects and programmes: European Energy Award, KlimaAktiv in Austria, etc.* • *Covenant of mayors* • *ALPACA (stock-taking No. 48)* • *Alpine building conference (stock-taking No. 38)* • *Existing training activities implemented in the Alps (e.g. climate adaptation consulting in Tyrol, stock-taking No. 115)*
Step 1: **Recommendations for Alpine administrations** **2021-2022**	*Based on a review of existing activities of public administrations and existing guidelines, specific recommendations to support Alpine administrations in becoming a forerunner for climate action (mitigation and adaptation) are developed. These should include examples how to implement 50/50 projects to involve and motivate users of public buildings. Overall, the recommendations should highlight solutions to Alpine-specific challenges.*
Step 2a: **Training courses for public building managers** **2023-2030**	*Training courses for public building managers (e.g. in the frame of the Alpine training programme, see Pathway IP_E1 "Set-up a network of regional energy coordinators").* • *One week teaching courses, focusing on a transnational exchange and learning, or* • *Regional training courses, organized in the different Alpine languages*
Step 2b: **Set-up 50/50 projects with schools and other public buildings** **2023-2030**	• *Implementation of 50/50 projects in schools, kinder gardens, sports facilities or other public buildings in which the users can affect energy consumption (many good feedbacks from experimentation in France, based on the "Positive energy family challenge" that was duplicated in Savoie and Isere for school and even for municipalities)*
Step 3: **Energy retrofitting and climate proofing of majority of public buildings in the Alps** **2030-2040**	• *Most public buildings in the Alps are retrofitted towards climate-neutral buildings and are climate proofed to meet new needs under a changing climate.*
Stakeholders needed for implementation	• *Local and regional administrations* • *ALPACA network* • *Local and regional energy agencies*
Indicators for monitoring this pathway	• *Number of regional and local administrations that have implemented the recommendations* • *Number of participants of new training courses* • *Number of 50/50 projects implemented (or similar)*

		• *Percentage of public buildings which are retrofitted towards climate-neutral and climate-resilient buildings*
Link to other pathways		• *Direct link: IP_Tr2: Developing the Alps into a model-region for reduced working mobility; IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E1: Set-up a network of regional energy coordinators* • *Indirect link: IP_E2: Enabling an Alpine-wide energy democracy; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions*
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB in collaboration with ALPACA can develop the recommendations in step 1*
	Governance set-up	• *ACB supports the set-up of a training institution (step 2a), if possible in combination with the Alpine training programme (Pathway IP_E1: "Set-up a pathway of regional energy coordinators")* • *ACB supports private investment scheme to which 50/50 projects (measure 2b) can be linked*
	Twinning/know-how transfer	• *ACB can set-up contacts to relevant experts that could teach in the training courses.*
	Outreach	· -
	Knowledge hub	· -
Integration in the ACB communication strategy	Contents	*Information on pilot activities, recommendations, process, etc.*
	Tools	-

A3. Tourism

3.1 IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams)

Basic information				
Background and description of the pathway	*Tourism is one of the main sources of income in the Alps. Some 40% of the Alpine municipalities display significant tourism activities. However, tourism as cross-cutting economic activity faces several challenges related to climate change (mitigation and adaptation needs) but also to meet other environmental, social and economic objectives. The Alpine Convention has already worked intensively on the promotion of sustainable tourism, but additional efforts are needed to meet the objectives of climate proofing Alpine tourism.* *As tourism destinations already start i) to align their offers to new tourism demand for low-carbon vacations as well as to new regulations regarding energy and climate legislation in their respective national and regional frameworks and ii) to diversify their offers to adapt to climate change impacts, a stronger coordination of strategies and tools seems necessary. Aims are: i) avoiding unwanted distributional effects between tourism destinations that could arise from different approaches on developing climate-friendly and climate-neutral tourism offers, ii) ensuring that the carrying capacity of specific tourism sites is not overstressed, taking into account potential impacts of climate change and iii) optimizing overall development of tourism activities in a qualitative way under the precondition of decarbonisation. This includes a coordination of strategic approaches towards development of climate-neutral and climate-resilient tourism offers, climate goals/targets as well as financial aspects related to tourism development (and other incentive measures) as well as monitoring & reporting issues.*			
Final output	• *Set-up of an Alpine strategy on coordinated climate-neutral and climate-resilient tourism* • *Alignment of financing streams (from intensive tourism which does not take into account climate mitigation and adaptation needs towards sustainable, climate-friendly and climate-resilient tourism)* • *Set-up of a reporting framework for tourism destinations on sustainable tourism*			
Alpine specific character	*Alpine tourism destinations have interactions on different levels and several of them already coordinate their offers and marketing activities to attract specific target groups. Due to the close distance between tourism destinations and the multiple destinations with comparable facilities and offers, there might be partly unwanted distributional effects between tourism regions if they do not align their strategies and take different approaches on tourism development (intensive vs. sustainable/extensive offers).*			
	Mitigation	x	Adaptation	x

<table>
<tr><td>Link to mitigation and/or adaptation</td><td>Actions to develop climate-neutral and climate-resilient Alpine tourism shall take an integrated approach, considering synergies between the two elements.</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

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<tr><td>Start of first implementation step</td><td>Now</td></tr>
<tr><td>End of last implementation step</td><td>2030</td></tr>
<tr><td>Starting point already available?</td><td>yes</td></tr>
</table></td></tr>
<tr><td>Link to target system</td><td>Direct link: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_Tou1: Car-free, attractive tourism traffic; T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Agr2: Alpine value chains for agricultural products; T_MA1: Municipalities as transition engines; T_MA3: Networks of CO_2-free municipalities
Indirect link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement; T_E5: Climate proofed Alpine hydropower; T_Tr1: Modal shift of Alpine freight transit; T_Tr4: Decarbonised transport fleet; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr3: The Alps as model region for organic farming T_Agr4: Resilient and climate-friendly mountain agriculture; T_S1: Minimised land-take and sealing; T_MA2: Climate action institutionalized in municipal action; T_RD1: The Alps as model region for vulnerability assessments</td></tr>
<tr><td colspan="2">Sequence of implementation steps</td></tr>
<tr><td>Starting point and links to stock-taking</td><td>RSA4 “Sustainable Tourism in the Alps – Report on the State of the Alps” (2013)
Report of the WG Sustainable Tourism (2016)
"Mobility solutions in the Alps" database (2015)
Initiatives of NGOs (“… einfach schön” of Alpenvereine Deutschland, Österreich, Südtirol)</td></tr>
<tr><td>Step 1a: Success factors and indicators for climate-friendly & climate-resilient Alpine tourism

2021-2023</td><td>Based on a synthesis of existing best practice collections on climate-friendly and climate-resilient tourism and a targeted review of new and innovative solutions, a list of success factors for implementation of sustainable climate-friendly and climate-resilient Alpine tourism will be developed. This should also take into account a status-quo analysis of tourism demand and specific tourism needs regarding climate-friendly Alpine tourism.
These success factors (derived from tourism supply and demand analysis) will be transposed into potential indicators to measure the transformation of Alpine tourism, a basis for further steps within this pathway.</td></tr>
</table>

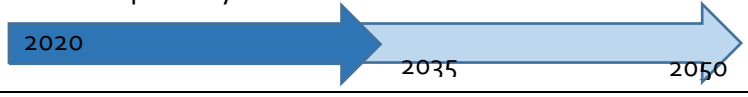
Step 1b: **Filling data gaps on CC impacts in the Alps and dissemination to stakeholders** **2021-2023**	*At the same time, some data gaps on CC impacts on Alpine tourism need to be filled to ensure a broad and science-based information basis for the strategic activities. Especially, the following gaps have been identified:* • *More detailed information on climate change impacts, with data resolved to the local level, on tourism in the Alps (transposing "hard" scientific facts into economic and social impacts on regional/local level)* • *Exploring potential ambivalent effects: vulnerabilities of different Alpine tourism types to CC impacts (i.e. are climate-friendly tourism destinations more vulnerable to CC impacts than tourism destinations without a specific focus on climate aspects? intensive tourism offers?)* • *Filling data gaps regarding information on tourism demand: tourists motivation as well as touristic distribution patterns and behaviour, linked to climate change and environmental factors.* *Findings from these exercises should be disseminated to relevant stakeholders to ensure that they are considered in further planning processes (e.g. dissemination via information hub).*
Step 2a: **Coordination of tourism strategies at Alpine-wide level** **2023-2028**	*Based on this broad knowledge on impacts and success factors, a broad strategic coordination process at Alpine level will be launched to better coordinate the transformation of tourism destinations (participation of regional and local authorities as identified in the frame of the Transport Protocol, Art. 4).* *This coordination process has to build on needs of the tourism sector to find acceptance in the market. It thus has to build on a broad stakeholder participation and will include the following elements (based on guidelines already identified in the Tourism Protocol, Art. 6):* • *Delimitation of areas/tourism destinations that further develop intensive tourism offers vs. areas/destinations that focus on soft and sustainable tourism: exchange on good practices and recommendations on approaches which are replicable in other Alpine tourism destinations.* • *Definition of "carrying capacities" for tourism hot-spots and tools to steer tourism demand in these areas (linked to preservation objectives and enhancement of resilience)* • *Coordination of further development of specific tourism offers → joint destination marketing, with clear focus on climate-friendly and climate-resilient tourism offers* • *Definition of a common set of specific CO_2-reduction targets as well as climate-resilience targets for Alpine tourism, if possible defined at level of tourism destinations*
Step 2b: **Alignment of financing streams to support climate-neutral and climate-resilient tourism offers**	*A discussion of financing streams and incentive programmes for sustainable and climate-friendly tourism development will be launched:* • *Assessment of status-quo: analysis of existing subsidies/financial support to different tourism segments* • *Discuss options on how to better align these funding streams to the success factors and indicators as defined in step 1b and the strategic approach as defined in step 2a*

2023-2028	
Step 3: Set-up of climate reporting framework **2028-2030**	*Taking into account the results of step 2a, especially the set of goals/targets, a climate-reporting framework for Alpine tourism destinations will be developed. This framework takes into account methodological approaches of other indicator systems (e.g. UNWTO Network of Sustainable Tourism Observatories[4]) and defines the reporting needs and methods for tourism destinations as well as the further monitoring process (beyond 2030).*
Stakeholders needed for implementation	*This pathway needs a broad involvement of experts of existing networks and stakeholder of tourism in the Alps ("big players", testimonials of different sectors like hotels/gastronomy, public transport, specific tourism offers etc.). Further:* *National and regional administrations and bodies involved in tourism development (including representatives from strategic development as well as marketing)* *Representatives/stakeholders of tourism destinations* *NGOs involved in promoting sustainable tourism (CIPRA, Alpenvereine, ALPARC e.g.)* *Meteorological services*
Indicators for monitoring this pathway	• *Step 1: Qualitative description of achieved results* • *Step 2a: Number and classification of tourism destinations that participate in the coordination process (classification: e.g. including data on surface, inhabitants, number of tourism beds, overnight stays and number of arrivals/year (summer/winter).* • *Step 2b: Qualitative description on discussion process* • *Step 3: Qualitative description of reporting framework. Number of destinations which agree to participate in the reporting*
Link to other pathways	• *Direct link: IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_E1: Set-up a network of regional energy coordinators; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture* • *Indirect link: IP_Tr1: Strategies for decarbonisation of Alpine freight transport; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E2: Enabling an Alpine-wide energy democracy; IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Eco1: Protection and management of vulnerable and Alpine specific*

[4] http://insto.unwto.org/

	landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB together with other thematic working bodies of the AC to develop best practice synthesis and launch project on data gaps.*
	Governance set-up	• *ACB proposes set-up of a steering group to guide the coordination process for an Alpine-wide tourism strategy. This steering group will be responsible for further steps of this pathway.* • *National focal points can reach out to decision makers at national as well as at destination level to gain support for coordinated strategy and to launch political discussion on financing streams.*
	Twinning/know-how transfer	. -
	Outreach	• *Specific outreach activities of ACB to involve stakeholders involved in destination management and to inform about coordinated Alpine tourism strategy.*
	Knowledge hub	• *Information on climate-reporting framework for tourism destinations can be linked to knowledge hub.*
Integration in the ACB communication strategy	Content	*Information on results of the filled data gaps on CC impacts in the Alps, model regions, best practices, etc.*
	Tools	*If relevant: tools and methods to guide the reporting framework for tourism destinations.*

3.2 IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism

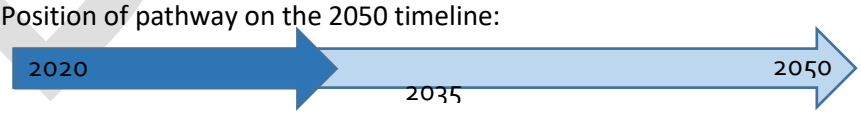
Basic information	
Background and description of the pathway	*Decarbonising Alpine tourism and ensuring that climate-resilience of tourism destinations and offers is improved requires considerable know-how and expertise of all relevant stakeholders which are involved in providing tourism services and infrastructures. Regarding climate mitigation, this requires detailed knowhow on types and impacts of potential mitigation measures; with respect to adaptation, tourism stakeholders need specific knowhow on potential climate impacts as well as different options for diversifying tourism offers to reduce their vulnerability to these impacts.* *As many of these stakeholders are small- to medium-scale actors, they often do not have the relevant background to consider the full scope of necessary measures and to evaluate different measures and options within their range of action. There is a lack of specific education on energy efficiency, the role of regional value chains, etc. for example for stakeholders in the gastronomy and hotel sector. The same is true for operators of large tourism infrastructures, which need to understand the full extent of potential climate threats to climate proof their existing and potential new infrastructures as well as for destination managers which require information regarding diversification needs and potentials.* *In line with pathway IP_Tou1 "Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism", this pathway implements several forms of support, coaching and capacity building methods to ensure that the vision is fully implemented by all stakeholders involved in the tourism sector and that existing know-how and innovative approaches are fully explored.*
Final output	• *Installation of "Climate caretakers for Alpine tourism" in each tourism destination* • *Open-access manual with sector-specific support tools for tourism stakeholders to enable mitigation and adaptation measures at company level* • *Decision making tool for developing new and diversified tourism offers in a participatory approach* • *Coordinated framework for destination and tourism services marketing which are linked to climate-neutral vacations*
Alpine specific character	*Tourism plays an important economic role for the Alpine economy. At the same time, tourism destinations will be highly affected by climate change and need to adapt their offers and services.*
Link to mitigation and/or adaptation	Mitigation: x; Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline: 

	Start of first implementation step	*Now*
	End of last implementation step	*2030*
	Starting point already available?	*yes*
Link to target system	• *Direct link: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_Tou1: Car-free, attractive tourism traffic; T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Agr2: Alpine value chains for agricultural products; T_MA1: Municipalities as transition engines; T_MA3: Networks of CO_2-free municipalities* • *Indirect link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement; T_E5: Climate proofed Alpine hydropower; T_Tr1: Modal shift of Alpine freight transit; T_Tr4: Decarbonised transport fleet; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr3: The Alps as model region for organic farming T_Agr4: Resilient and climate-friendly mountain agriculture; T_S1: Minimised land-take and sealing; T_MA2: Climate action institutionalized in municipal action; T_RD1: The Alps as model region for vulnerability assessments*	
Sequence of implementation steps		
Starting point and link to stock-taking	• *RSA4 "Sustainable Tourism in the Alps – Report on the State of the Alps" (2013)* • *"Mobility solutions in the Alps" database (2015)* • *Report of the WG Sustainable Tourism (2016)* • *Activities implemented in the frame of the German Presidency: "Best practice guide on energy management in Alpine hotels" (stock-taking No. 41), "Workshop "Sustainable Economy in the Alps – Climate mitigation and Energy Efficiency in Hotel and Restaurant businesses" (stock-taking No. 42), "Online platform "Alpine Energy" for knowledge transfer on Energy Efficiency in the Hotel and Restaurant businesses" (stock-taking No. 43).* • *Support tools implemented by mountaineering clubs, e.g. "Energieeffizienz im Hüttenwesen (Energy efficient mountain huts)" (stock-taking No. 62)* • *Good practice examples and learnings of the participants of the ClimaHost contest that showed innovative solutions for climate protection and energy efficiency in the hotel industry and gastronomy in the Alpine region*	
Step 1: **Strategy and set-up of climate caretaker network**	*Develop a strategy and set-up of an operational network of "climate caretakers", as broad as possible across the Alps:* • *Enhance capacity of tourism stakeholders on climate mitigation and adaptation* • *Link to know-how and expertise of other regional coordinators (if not integrated)*	

2021-2022	• *Support implementation measures, including communication and awareness raising activities (link to climate-neutral tourism packages as proposed in pathway IP_Tou3 "Exploring the use of tourism packages for climate-neutral tourism")*
Step 2a: Open-access manual for climate proofing Alpine tourism **2021-2025** **(continuous update)**	*Development of a manual for different stakeholders in the tourism sector to improve their CO_2-footprint and to identify potential climate impacts:* • *Energy efficiency of buildings (gastronomy, hotels)* • *Tourism mobility/transport* • *Provision of regional products/establishing regional value chains* • *Information and communication* *The manual should be developed as open-access tool, which can be improved and updated continuously by the users (e.g. including a help function). If possible, the manual can be linked to the climate-neutral tourism packages as developed in pathway IP_Tou3.*
Step 2b: **Decision making tool for evaluating new tourism offers** **2022-2025**	*Similar to the manual in step 2a, a decision making tool for evaluating different diversification strategies is developed. This decision making tool can be used by the "climate caretakers" together with stakeholders of tourism destinations to develop new tourism offers.*
Step 3: **Coordinated framework for destination marketing** **2030**	*Considering the experiences made under steps 1 and 2, a coordinated framework for destination marketing, linked to climate-neutral vacations, will then be developed together with the network of "climate caretakers" and relevant stakeholders. This common destination marketing should also provide a link to the climate-neutral tourism packages as developed in pathway IP_Tou3.*
Stakeholders needed for implementation	*This pathway needs a broad involvement of experts of existing networks and stakeholder of tourism in the Alps ("big players", testimonials of different sectors like hotels/gastronomy, public transport, specific tourism offers etc.). Further:* *National and regional administrations involved in tourism development* *Representatives/stakeholders of tourism destinations* *NGOs involved in promoting sustainable tourism (CIPRA, Alpenvereine, ALPARC e.g.)* *Regional coordinators as implemented in other fields of action (pathway IP_E1, IP_Tr2, IP_NH1)*
Indicators for monitoring this pathway	• *Step 1: Number of climate caretakers installed in Alpine tourism destinations* • *Step 2a: Set-up of a manual: yes/no + qualitative description, number of tools that are integrated in the manual, number of open access contributions, number of users*

	• *Step 2b: Set-up of decision making tool: yes/no + qualitative description, number of users per year* • *Step 3: Set-up of framework yes/no + qualitative description*	
Link to other pathways	• *Direct link: IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture* • *Indirect link: IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_NH3: Support measures to enhance individual risk precaution; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Caretakers: The ACB together with other relevant Alpine Convention bodies can define a strategy to implement the "climate caretakers", including a work description/profile as well as potential options for financing.*
	Governance set-up	• *Manual: the ACB together with the caretakers to define a steering group which is in charge of setting-up the manual*
	Twinning/know-how transfer	• *Know-how transfer/coaching can be provided via the open-access manual. E.g. authors of specific entries can offer their support/ coaching to other users.* *→ No specific need for AC bodies once the manual and the caretaker network is established.*
	Outreach	• *The ACB can raise visibility of the approach, especially regarding the transformational impact of the tourism pathways.*
	Knowledge hub	• *Manual can be linked to ACB info hub.*
Integration in the ACB communication strategy	Content	*Information on all aspects in communication activities of ACB.*
	Tools	*Manual to be linked to ACB info hub.*

3.3 IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism

<table>
<tr><td colspan="2">Basic information</td></tr>
<tr><td>Background and description of the pathway</td><td>Sustainability considerations play a more and more important role for the choice of tourism destinations. Especially in the Alps, with its high role of nature-based tourism, many tourists are already aware of the need for better protecting the Alps as sensitive environment and for reducing the CO_2-footprint of their holidays. There is already a growing demand for low-carbon holiday offers, e.g. tourists chose their hotels according to existence of energy-labelling schemes, availability of regional products, provision of public transport services, bike rental options, etc. However, tourism stakeholders have difficulties in clearly defining options to reduce the CO_2-footprint of their operations and in including them in their marketing activities. An integrated approach with the provision of climate-neutral and climate-resilient tourism packages would help to overcome this problem and would provide a clear signal for tourists on climate mitigation and adaptation activities in specific hotels and/or tourism destinations and would give a clear framework to tourism stakeholders on need for action.</td></tr>
<tr><td>Final output</td><td>Synthesis on existing approaches for providing climate-neutral holiday packages
Recommendations on the provision of climate-neutral tourism packages in the Alps
Fully climate-neutral tourism packages to be tested in several pilot sites
Framework for common promotion of climate-neutral tourism packages and reporting framework</td></tr>
<tr><td>Alpine specific character</td><td>High role of nature-based tourism in the Alps, potential for developing the Alps into model-region for climate-neutral tourism.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td><table><tr><td>Mitigation</td><td>x)</td><td>Adaptation</td><td>(x)</td></tr></table>It needs to be checked in the process, if adaptation aspects can also be considered within the tourism packages (e.g. tourism destinations need to provide diversified tourism offers).</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

<table><tr><td>Start of first implementation step</td><td>Now</td></tr><tr><td>End of last implementation step</td><td>2030</td></tr><tr><td>Starting point already available?</td><td>yes</td></tr></table></td></tr>
<tr><td>Link to target system</td><td>Direct link: T_Tr2: Reduced car-dependency (inner-Alpine and transalpine passenger transport); T_Tr3: Reduced transport demand (passenger and freight); T_Tou1: Car-free, attractive tourism traffic; T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Agr2:</td></tr>
</table>

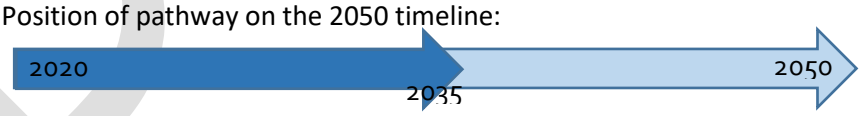
	Alpine value chains for agricultural products; T_MA1: Municipalities as transition engines; T_MA3: Networks of CO_2-free municipalities • *Indirect link: T_E1: Alpine efficiency solutions; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_E4: Alpine energy democracy/citizen involvement; T_E5: Climate proofed Alpine hydropower; T_Tr1: Modal shift of Alpine freight transit; T_Tr4: Decarbonised transport fleet; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr3: The Alps as model region for organic farming T_Agr4: Resilient and climate-friendly mountain agriculture; T_S1: Minimised land-take and sealing; T_MA2: Climate action institutionalized in municipal action; T_RD1: The Alps as model region for vulnerability assessments*
Sequence of implementation steps	
Starting point and link to stock-taking	• *RSA4 "Sustainable Tourism in the Alps – Report on the State of the Alps" (2013)* • *"Mobility solutions in the Alps" database (2015)* • *Report of the WG Sustainable Tourism (2016)* • *Activities implemented in the frame of the German Presidency: "Best practice guide on energy management in Alpine hotels" (stock-taking No. 41), "Workshop "Sustainable Economy in the Alps – Climate mitigation and Energy Efficiency in Hotel and Restaurant businesses" (stock-taking No. 42), "Online platform "Alpine Energy" for knowledge transfer on Energy Efficiency in the Hotel and Restaurant businesses" (stock-taking No. 43).* • *Portal for Sustainable & Responsible Tourism in the EU: https://destinet.eu/Support tools implemented by mountaineering clubs, e.g. "Energieeffizienz im Hüttenwesen (Energy efficient mountain huts)" (stock-taking No. 62)* • *Good practice examples and learnings of the participants of the ClimaHost contest that showed innovative solutions for climate protection and energy efficiency in the hotel industry and gastronomy in the Alpine region* • *Existing labelling schemes: Alpine Pearls Initiative (stock-taking No. 47), "Bergsteigerdörfer"/Mountaineer Villages (stock-taking No. 61).*
Step 1: **Synthesis of existing low-carbon or climate-neutral tourism packages and their footprinting approaches** **2021-2022**	*In a first step, a review will identify existing offers and services regarding the provision of climate-neutral tourism packages (Alpine countries, other EU countries, other mountain regions worldwide). The review will provide an overview on all relevant aspects which are covered in these existing approaches (e.g. energy management systems, labelling systems on organic products, "slow food", transport-related labels, etc.). Also, the review will provide information on methodological approaches, especially the methodologies for calculating the relevant carbon footprints of these packages and the use of compensation measures.* *A special focus during this review will be the acceptance and feasibility aspects of the existing tourism packages. An Alpine-wide approach for providing climate-neutral tourism packages should be attractive in form of low administrative hurdles/limited reporting needs but should at the same time remain effective.*

Step 2: **Recommendations on climate-neutral tourism packages in the Alps** **2022-2025**	*Based on the results of step 1 and also on Step 2a: Open-access manual for climate proofing Alpine tourism of pathway IP_Tou2 "Coaching and capacity building for climate proofing Alpine tourism", a framework for climate-neutral tourism packages for Alpine tourism is developed, This framework should take into account all climate-relevant fields of action in the tourism sector, with a special focus on CO_2-free buildings, low-carbon transport within and to the destinations, food and beverages but also including criteria for communication & awareness raising campaigns which need to be implemented by applicants.* *The development of the framework is conducted in a broad participatory approach, taking into account relevant tourism stakeholders and the needs and demands of tourists.*
Step 3: **Pilot projects on climate-neutral tourism packages** **2025-2030**	*In this step, the feasibility of providing fully climate-neutral holiday offers in the Alps will be tested. Within several pilot projects, tourism destinations in all Alpine countries will test the provision of "climate-neutral tourism packages", which can be booked as care-free holiday packages.*
Step 4: **Promotion activities for climate-neutral tourism packages and control mechanism** **2026-2030**	*Based on the activities in step 3, common measures for promotion and dissemination of the climate-neutral tourism packages are developed. Also, this working step includes the set-up of a control mechanism for monitoring effectiveness and application of the climate-neutral tourism packages.*
Stakeholders needed for implementation	*This pathway needs a broad involvement of experts of existing networks and stakeholder of tourism in the Alps ("big players", testimonials of different sectors like hotels/gastronomy, public transport, specific tourism offers etc.). Further:* *National and regional administrations involved in tourism development* *Representatives/stakeholders of tourism destinations* *NGOs involved in promoting sustainable tourism (CIPRA, Alpenvereine, ALPARC e.g.)* *Regional coordinators as implemented in other fields of action*
Indicators for monitoring this pathway	• *Step 1: Development of synthesis yes/no + qualitative descript.* • *Step 2: Development of framework for climate-neutral tourism packages yes/no + qualitative description* • *Step 3: Number of pilot projects to develop "climate-neutral tourism packages"* • *Step 4: Set-up of destination management framework yes/no + qualitative description*

Link to other pathways	• *Direct link: IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture* • *Indirect link: IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_NH3: Support measures to enhance individual risk precaution; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Synthesis: ACB together with other relevant bodies of the AC can implement the synthesis of existing tourism packages* • *ACB can motivate the Alpine Conference to provide financial resources to the pilot projects as developed in step 3 as well as to potential expansion and continuity of climate-neutral tourism offers.*
	Governance set-up	• *ACB to set-up a steering group which is in charge of developing the framework for climate-neutral tourism packages(step 2) and the pilot projects for climate-neutral tourism packages (step 3)*
	Twinning/know-how transfer	• *Members of ACB or other Alpine Convention bodies can use their contacts to motivate regions to take part in pilot projects*
	Outreach	• *All activities should be widely used in ACB communication and outreach activities. This is an aspect with high showcase-potential.*
	Knowledge hub	• *Knowledge hub of ACB can be linked to platform with information on tourism packages*
Integration in the ACB communication strategy	Content	*Broad information on all activities/results/experiences with development of framework for climate-neutral tourism packages and pilot projects.*
	Tools	*Framework for climate-neutral tourism packages (step 2) and reporting framework (step 4) can be linked to ACB hub.*

A4. Natural Hazards

4.1 IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks

Basic information	
Background and description of the pathway	*The Alps face a variety of natural hazards with different scopes including local events such as avalanches, rockfalls, torrential hazards and landslides as well as larger events like floods or severe storms. As natural hazards do not stop at regional or national borders, an Alpine-wide common framework to deal with such cross-border risks needs to be developed which also enables an exchange of experiences. Basically, risk management for cross-border risks involves the following three questions: 1) What are the potential cross-border hazard hot-spots? 2) What risk are we willing to take? 3) Which measures should we adopt? (RSA7).* *An Alpine-wide risk management plan on cross-border risks develops a common approach, especially regarding the methods of risk mapping and monitoring for cross-border risks, harmonisation of approaches to deal with residual risks and a common toolbox on measures (including innovative technologies). This Alpine-wide risk management plan should clearly focus on risks with large-scale and potential cross-border impacts, but should also enable an exchange on managing risks on the local scale.*
Final output	*Alpine-wide risk management plan*
Alpine specific character	*The Alps are specifically prone to natural hazards. A generally growing population and accumulation of human assets and settlements in hazard-prone areas as well as extreme events tend to increase natural hazard risk (RSA7).*
Link to mitigation and/or adaptation	Mitigation: Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2035* Starting point already available?: *yes*
Link to target system	• *Direct link: T_SP2: Planning systems in risk management changed from passive to proactive; T_NH1: Alpine risk management; T_NH2: Permafrost and erosion monitoring; T_NH3: Individual risk precaution; T_Fo1: Potential of protective mountain forests fully used; T_W3: Alpine-wide sustainable flood risk management; T_MA1: Municipalities as transition engines; T_RD1: The Alps as model region for vulnerability assessments; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers*

	• *Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes ; T_Fo4: Alpine-wide sustainable forest management; T_Agr4: Resilient and climate-friendly mountain agriculture; T_W1: Alpine-wide optimized water management; T_W2: Drinking water security*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Existing risk management systems implemented in the Alpine countries (e.g. Integrated Risk Management approach in CH, Risk mapping approaches in Germany regarding flood risk, transboundary flood risk management plans, etc.).* • *PLANALP activities, e.g. Alpine strategy for adaptation to climate change in the field of natural hazards (2013, PLANALP) (stock-taking No. 3), Recommendations on local adaptation to Climate Change for Water Management and Natural Hazards in the Alps (stock-taking No. 8), RSA 7 (stock-taking No. 28)* • *EUSALP AG8 activities* • *CAPA – Climate Adaptation Platform for the Alps (stock-taking No. 45)* • *Network of national adaptation policy makers of the Alpine countries (stock-taking No. 46)* • *Adapt-Alp (stock-taking No. 65)* • *Virtual Alpine Observatory VAO (DE, since 2014) (stock-taking No. 39)*
Step 1a: **Overview on natural hazard management planning and consideration of cross-border risks** **2021-2022**	*Information regarding natural hazard management for cross-border risks in the Alpine countries need to be gathered:* • *Information on relevant natural hazards and elements of the risk cycle which are covered in the risk management plans.* • *Specific approaches to deal with cross-border risks in national management plans* • *Shortcomings and best practices of national plans regarding management of cross-border risks (e.g. regarding early warning systems)* • *Consideration of innovative technologies in national plans, especially regarding coordination* • *Recommendations and lessons learned*
Step 1b: **Mapping hazard "hot-spots" for critical infrastructures and settlements** **2022-2025**	*Transport, energy and communication infrastructures build the backbone of the economy, especially for the Alps as crossroads for the European market and as important element of the European energy system. Also, health infrastructures have a cross-border function in the Alps. Specific risks/hot-spots for these critical infrastructures need to be identified in a common approach to develop coordinated adaptation solutions. Furthermore, „hot-spots" for action can arise in settlement areas which are affected by cross-border natural risks. Such hot-spots need to be identified in order to develop coordinated approaches for risk management.*
Step 2: **Common framework for risk-management of cross-border risks** **2030**	*Based on results of measures 1a and 1b, a common Alpine-wide framework for risk management is developed. This framework should take into account existing risk management systems and their approaches (e.g. existing flood risk management systems). The following steps need to be considered:* • *Definition of common steps/cycle of risk management*

	• *Definition of common methods and standards for risk mapping and monitoring, based on existing national legal framework conditions.* • *Delimitation of risks that should be considered in the common framework (local vs. cross-border impacts) (based on steps 1a and 1b)* • *Recommendations and toolbox on risk prevention measures for cross-border risks (e.g. regarding harmonization of early warning systems, regarding construction stops in flood-prone areas) and experiences.* • *Definition of specific measures to deal with hazard "hot-spots" for critical infrastructures and settlements* • *Recommendations for practitioners (could also include training/exchange)*
Step 3a: **Alpine warning system for extreme weather events** **2035**	*Coordination of early warning systems as implemented at national level: harmonization of approach and tools of warning systems.* *Establishing interlinkages of warning systems, also with larger warning systems implemented at EU/int. level e.g. EUMetNet, Meteo-Alarm…) to improve the management of cross-border risks* *Testing smart approaches of spreading information of early warning systems (Apps for smart phones/smart watches, etc.)*
Step 3b: Alpine-wide approach for natural hazard "hot-spots" **2035**	*Based on results of measure 1b, a coordinated approach to deal with "hot-spots" is developed:* • *Identify financing opportunities for structural protection measures, where justified from a cost-benefit perspective* • *permanent monitoring of hazard 'hot-spots'* • *preparing recovery measures if damages occur* • *taking a risk governance approach that seeks to strike a balance between risk prevention goals (adequate protection levels) and risk tolerance (acceptable risk levels), against the background of (public) costs-benefit considerations*
Stakeholders needed for implementation	• *PLANALP working group and EUSALP AG8* • *Decision makers at national and regional level* • *Decision makers at EU level and providers of meteorological data*
Indicators for monitoring this pathway	• *Overview on natural hazard management: number of Alpine countries which submitted information regarding their hazard management approaches* • *Common framework: number of Alpine countries that have implemented the common approach on risk management.* • *Natural hazard "hot-spots": number of hot-spots that are included in the coordinated approach* • *Alpine risk management plan adopted (yes/no)*
Link to other pathways	• *Direct link: IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming; IP_NH3: Support measures to enhance individual risk precaution; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests* • *Indirect link: IP_E1: Set-up a network of regional energy; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_S2: Defining*

	Alpine wide guidelines for minimised land-take and sealing; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Role of ACB or other bodies of the AC in implementing specific steps of the pathway themselves (e.g. for kick-starting the process, for providing background information, etc.)* • *ACB can work together with PLANALP to develop an approach for risk mapping of hot-spots (step 3b)*
	Governance set-up	-
	Twinning/know-how transfer	-
	Outreach	*Gain political acceptance for common approach on hazard hot-spots.*
	Knowledge hub	*Risk maps etc. can be linked to knowledge hub*
Integration in the ACB communication strategy	Content	*Information on risk management approach, hot-spot analysis, etc.*
	Tools	*Link to toolbox which is part of the common risk management framework.*

4.2 IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming

Basic information	
Background and description of the pathway	*Increasing temperatures affect the stability of Alpine permafrost. From the perspective of natural hazards prevention, it is important to know whether permafrost areas (e.g. rock glaciers) are still stable and what kind of hazards could be generated by them in the future. As permafrost areas extend beyond national borders, a coordinated approach on monitoring permafrost areas and potential erosion effects seems adequate.*
Final output	• *Alpine-wide permafrost and erosion monitoring* • *Implementation of pilot projects*
Alpine specific character	*Specifically the Alps react sensitively to temperature fluctuations. Instabilities in permafrost lead to large-scale erosion of soils and can have threatening impacts for the Alpine population and economy.*
Link to mitigation and/or adaptation	Mitigation: ; Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline: 2020 — 2035 — 2050 Start of first implementation step: *Now* End of last implementation step: *2030* Starting point already available?: *yes*
Link to target system	• *Direct link: T_SP2: Planning systems in risk management changed from passive to proactive; T_NH1: Alpine risk management; T_NH2: Permafrost and erosion monitoring; T_NH3: Individual risk precaution; T_MA1: Municipalities as transition engines; T_RD1: The Alps as model region for vulnerability assessments; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers* • *Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_Eco1: Preserved ecosystems and biodiversity*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Existing national permafrost monitoring systems (e.g. PERMOS for CH)* • *PermaNet Long-Term Permafrost Monitoring Network (stock-taking No. 72)* • *PLANALP activities* • *EUSALP AG8 activities* • *CAPA – Climate Adaptation Platform for the Alps (stock-taking No. 45)* • *Virtual Alpine Observatory VAO (DE, since 2014) (stock-taking No. 39)*
Step 1a:	• *Comprehensive Alpine wide stock taking and mapping of existing permafrost monitoring activities, stations and networks* • *Identifying and closing crucial gaps*

Stock-taking and mapping of existing systems **2021-2023**	
Step 1b: **Assessing potential of remote sensing data and services** **2021-2023**	*Assess the availability of remote sensing data and respective services (e.g. Copernicus) and their integration in an Alpine-wide permafrost risk monitoring system.* .
Step 2: **Alpine-wide permafrost risk monitoring** **2023-2025**	*Based on measures 1a and 1b, an integrated Alpine wide permafrost risk mapping and monitoring (continuous updates), including erosion and glacier-borne hazards is implemented.*
Step 3: Pilot projects in areas exposed to permafrost thawing **2025-2030**	*Implementation of pilot projects for risk mitigation and contingency planning (e.g. in concrete areas exposed to permafrost thawing, glacial lake outburst, rock-fall & erosion)*
Stakeholders needed for implementation	• *PLANALP working group and EUSALP AG8* • *Members of VAO* • *Decision makers at national and regional level* • *Decision makers at EU level and providers of meteorological data*
Indicators for monitoring this pathway	• *Common monitoring system: number of Alpine countries which have integrated their permafrost and erosion monitoring systems into the Alpine-wide framework; number of activities, stations and networks included in the stock-taking and mapping* • *Remote sensing: qualitative description of assessment, with reference to the different Alpine countries and their approaches* • *Pilot projects: number of pilots*
Link to other pathways	• *Direct link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_NH3: Support measures to enhance individual risk precaution; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions*

Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*ACB can coordinate stock-taking (step 1a) and analysis of remote sensing options (step 1b) in cooperation with PLANALP*
	Governance set-up	-
	Twinning/know-how transfer	-
	Outreach	*Increase visibility of pilot projects (step 3)*
	Knowledge hub	*Risk monitoring is linked to knowledge hub of ACB.*
Integration in the ACB communication strategy	Content	*Information on potential CC impacts on Alpine permafrost areas, information on risk mapping and monitoring, etc.*
	Tools	*Risk mapping*

4.3 IP_NH3: Support measures to enhance individual risk precaution

Basic information				
Background and description of the pathway	*Full protection from natural hazards and climate change impacts through public-financed protection measures will not be feasible, private households and economic stakeholders will have to develop additional risk precaution measures. Individual measures can include no-regret measures with co-benefits (e.g. passive cooling systems to deal with increasing heat and at the same time to support energy efficiency) but also protection measures for natural hazards (e.g. provision of sandbags to protect from flooding).* *An Alpine-wide risk governance approach has the objective to give a stronger role to the civil society in risk management. To meet this objective, additional measures on awareness raising and capacity building are however necessary. Also, a coordination of individual measures through regional coordinators has the potential to trigger considerable activities through streamlining and making use of effects of scale.*			
Final output	• *Development of a comprehensive toolbox for capacity building and supporting individual risk precaution measures* • *Implementation of network of adaptation coordinators* • *Implementation of funding/incentive scheme to support individual risk precaution measures.*			
Alpine specific character	*High vulnerability in the Alps*			
Link to mitigation and/or adaptation	Mitigation	*(x)*	Adaptation	x
	The focus is clearly on adaptation – through capacity building and awareness raising, the pathway however also contributes to a better understanding of climate change and the need for mitigation.			
	Position of pathway on the 2050 timeline:  			

Implementation timeframe	2035 2050	
	Start of first implementation step	*Now*
	End of last implementation step	*2030*
	Starting point already available?	*yes*
Link to target system	• *Direct link: T_SP2: Planning systems in risk management changed from passive to proactive; T_NH1: Alpine risk management; T_NH2: Permafrost and erosion monitoring; T_NH3: Individual risk precaution; T_MA1: Municipalities as transition engines; T_RD1: The Alps as model region for vulnerability assessments* • *Indirect link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_E4: Alpine energy democracy/citizen involvement; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers*	
Sequence of implementation steps		
Starting point and link to stock-taking	• *Existing Best Practices: "local natural hazard advisor" in Switzerland or the "adaptation advisory services for municipalities" in Austria* • *Project on developing regional adaptation strategies: e.g. https://klar-anpassungsregionen.at/, Klimzug programme in Germany (until 2014))* • *Project KlimaAlps (INTERREG Austria-Bavaria)* • *Project FRANCA (flood risk anticipation and communication in the Alps) (EU LIFE programme)* • *Project PATCH:ES - Private Adaptation Threats and Chances: Enhancing Synergies with the Austrian NAS Implementation* • *See all measures listed for Pathway "Implementation of an Alpine-wide permafrost and erosion monitoring"* • *GoApply – Multidimensional governance of climate change adaptation in policy making and practice (Project ASP) (stock-taking No. 69)* • *Klima-Toolbox Surselva (stock-taking No. 88)* • *Local adaptation to climate change in Alpine municipalities in Italy (seminars for practitioners) (stock-taking No. 110)* • *Climate adaptation consulting for municipalities (stock-taking No. 115)*	
Step 1a: **Toolbox for individual risk precaution** **2021-2022**	*Alpine adaptation toolbox:* • *Teaching materials* • *Toolbox to develop local/regional adaptation planning* • *Tools to assess risk at household level and to explore adaptation options* • *Links to risk maps* *Linked to CAPA*	
Step 1b: **Network of regional adaptation coordinators**	*Set-up of an operational network of regional adaptation coordinators, if possible in all regions of the Alpine area to:* • *Increase capacity of local decision makers and the civil society* • *To ensure an effective knowledge transfer* • *To support and coordinate specific implementation measures* .	

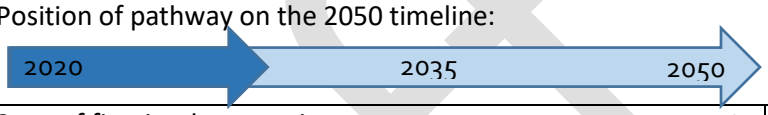
2022		
Step 2a: **Implementation of Alpine-wide standardized qualification program** **2025-2030**	*Capacity building programme for teachers, educators, education institutions etc.*	
Step 2b: **Road show with risk-experience** **2025-2030**	*Roadshow targeting at citizens, educators, local authorities, etc. with hands-on experiences:* • *Virtual Reality experiences, e.g. to visualize impacts of permafrost thawing* • *Visualisation of risk maps, etc.* • *Training session on using protection materials* • *Etc…*	
Step 3: **Incentive programme for individual measures** **2030**	• *Incentivizing individual risk precaution measures (e.g. flood-protection measures for buildings, climate-neutral solutions for cooling, etc.)*	
Stakeholders needed for implementation	• *Existing regional energy coordinators and climate alliances* • *Network ALPACA for communication and coordination* • *Alliance in the Alps, Alpine Town of the Year Association* • *Decision makers at local, regional and national level* • *PLANALP working group and EUSALP AG8*	
Indicators for monitoring this pathway	• *Toolbox: number of tools integrated in the toolbox* • *Network: Number of regional adaptation coordinators organised in an Alpine wide network* • *Qualification program: number of participants* • *Road show: number of road show stops and participants* • *Incentive programme: number of protection measures incentivised*	
Link to other pathways	• *Direct link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming* • *Indirect link: IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests*	
Relevance of measure for the Alpine Convention		
	Implementation	• *Implementation of roadshow together with PLANALP*

Role of the Alpine Convention to implement the pathway	Governance set-up	• *National Focal Points can call on national and regional authorities to set-up adaptation coordinators* • *ACB could support identification of potential funding sources* • *Kick-start the set-up of a standardized qualification programme (link to Alpine Academy)* • *Encourage coordination with insurance sector to identify options for incentive programmes to support individual risk precaution measures.*
	Twinning/know-how transfer	-
	Outreach	*Outreach to increase awareness on role of adaptation coordinators and their qualification, identify potential applications for the position.*
	Knowledge hub	*Toolbox on individual risk precaution can be linked to knowledge hub.*
Integration in the ACB communication strategy	Content	*Information on new policy instruments and exchange of Best practices.*
	Tools	*Toolbox for individual risk precaution* *Roadshow*

A5. Water

5.1 IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management

Basic information	
Background and description of the pathway	*Climate change will put additional pressures on Alpine water resources: changes in precipitation patterns, reduced snow cover in winter as well as rising temperatures will have effects on the quantitative water balance and water availability. This is already affecting the runoff regimes of rivers, groundwater availability, discharges of springs as well as water levels in natural and artificial lakes. On regional scale, exceptional situations of both water scarcity and floods are expected to become more frequent and more severe, with those Alpine regions that are already affected by dropping groundwater levels and temporal water scarcity today being highly vulnerable in the future.* *At the same time, water management and its integration in spatial planning processes, is an element of climate mitigation and adaptation strategies which also needs to be coordinated at river basin scale. As surface water systems and groundwater aquifers in the Alps are highly interlinked across borders (all rivers flow into five main Alpine river basins), a common approach to deal with these additional challenges for water management is needed.* *The EU Water Framework Directive (WFD) already provides a set of guidelines for Integrated River Basin Planning, which also allows for integrating water management into climate mitigation and adaptation strategies as well as for closer integration between spatial planning processes and water management. In practice, all Alpine countries do already have River Basin Management Plans according to the WFD, and several pilot projects on transboundary River Basin Management are on the way, but in most cases the transboundary focus is still missing, even for larger rivers which do cross two or more Alpine countries. To reach this objective, an Alpine-wide framework should promote transboundary planning tools and participation processes as well as enable intersectoral cooperation (administrative level) and integration of the key stakeholder groups within a river basin beyond the national processes of River Basin Management Plans.*
Final output	• *Identification of hot-spots regarding water conflicts and mapping of ongoing coordination activities at transboundary activities and transboundary rivers of great urgency for cross-border cooperation* • *Implementation of transboundary model projects in every Alpine country to promote a transboundary focus in mainstreaming climate change into water management and for integrating water management into spatial planning and climate mitigation and adaptation planning.*
Alpine specific character	*Rivers and lakes in the Alpine River Basins are closely interlinked and pressures on water resources have effects beyond regional and national borders. Also, Alpine waters have an effect on large downstream river basins.* *So far, the Alps have profited from sufficient water of good quality. But climate change shifts the scope of Alpine Water Management more and more towards managing fluctuations in water resources: Changing patterns in temperatures and precipitations increase the frequency and volumes of floods. Simultaneously, droughts – hitherto a lesser concern and*

	only an issue in the southern parts of the Alpine Arc – are an increasing threat. At the same time, climate change increases the users´ demands (for irrigation, cooling, artificial snowmaking and other recreation activities, hydropower etc.), see more about this topic in IP_W2: Tools and methods for drought management in the Alps) Atmospheric temperature increases and the average temperature increase in the Alpine area is nearly twice as high as in the surrounding areas. Because of that also the water temperature of surface and groundwater bodies of Alpine rivers and lakes rises. This directly affects water quality, aquatic ecosystems and their populations as well as biodiversity.			
Link to mitigation and/or adaptation	Mitigation		Adaptation	x
	An optimized water management focuses on both quantitative and qualitative water status and has a link to flood and drought risk management, but increases the climate-resilience of the river ecosystems as well as of the humans depending on the water resources			
Implementation timeframe	Position of pathway on the 2050 timeline: 			
	Start of first implementation step			*Now*
	End of last implementation step			*2026*
	Starting point already available?			*yes*
Link to target system	• *Direct link: T_E4: Alpine energy democracy/citizen involvement; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_W1: Alpine-wide optimized water management; "T_W2: Drinking water security; T_W3: Alpine-wide sustainable flood risk management; T_RD1: The Alps as model region for vulnerability assessments* • *Indirect link: T_SP2: Planning systems in risk management changed from passive to proactive; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_NH1: Alpine risk management; T_Agr1: Energy self-sufficiency of Alpine farms; T_S1: Minimised land-take and sealing; T_S2: Enhanced Alpine soil quality; T_RD3: Alpine-wide climate-data availability*			
Sequence of implementation steps				
Starting point and links to stock-taking	• *RSA2: Water and water management issues (2009)* • *Guidelines on local adaptation to Climate Change for Water Management and Natural Hazards in the Alps (Platform Water Management, 2014) (stock-taking No. 8).* • *Initiative "Strategic planning: How to face drought periods in the Alpine Region" (stock-taking No. 10).* • *5th International Water Conference "Water in the Alps - and beyond: adapting Alpine and mountain river basins to climate change" (2014): online proceedings* • *7th International Water Conference (Breitenwang 2018, together with the ForumAlpinum)* • *Project SPARE - Strategic Planning for Alpine River Ecosystems (Alpine Space Programme)* • *Project AlpWaterScarce - Water Management Strategies against Water Scarcity in the Alps (Alpine Space Programme)*			

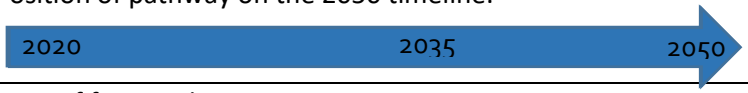
	• *Project C3-Alps - Capitalising Climate Change Knowledge for Adaptation in the Alpine Space: pilot activities on water management in France and Italy (Alpine Space Programme)* • *Project SILMAS – Sustainable Instruments for Lakes Management in the Alpine Space (Alpine Space Programme)* • *EEA (2009): Regional climate change and adaptation: The Alps facing the challenge of changing water resources. EEA Report No 8/2009.* • *Best practise examples presented at the AC Water Conference in Annecy in February 2020* • *EUSALP AG 6 study on Alpine Water Governance* • *EUSALP AG 7 list of rivers with a need for enhanced transboundary cooperation*
Step 1: Identification of hot-spots regarding water conflicts, mapping of ongoing coordination activities at transboundary rivers and of transboundary rivers of urgency for cross-border cooperation **2021-2022**	*Based on the mapping exercise which was carried out during the ForumAlpinum 2018 in Breitenwang,[5] the approach will be systematically further developed with the objective to obtain a comprehensive conflict map for the Alpine region.* *This can be compared with the National River Basin Management Plans as well as the proposed hot-spot analysis in pathway IP_W2 and links to ongoing activities on national or transnational level, e.g. as already initiated in the large Alpine river basins (e.g. Rhône, Inn, Ticino) as well as to activities of EUSALP AG6 and AG7. Ongoing coordination activities as well as information about transboundary rivers of urgency for cross-border cooperation shall be integrated in the mapping approach to allow a comprehensive overview of conflicts as well as status-quo. On this basis, model river basins are identified where increased cooperation between neighbouring countries would support the avoidance of conflicts between different water use interests, as well as increase the resilience of the river ecosystems and the adaptive capacities of the user management.*
Step 2a: Implementation of model projects for transboundary and climate proof integrated water management **2022-2026**	*With respect to the model river basins, respectively regions identified in step 1, workshops will be organized to increase regional and transboundary cooperation, by promoting* • *Participatory & cooperative methods and water governance approaches to improve conflict management, especially making use of water-based spatial planning approaches* • *Nature-based solutions and opportunities for water storage/retention management by considering ecosystem-based approaches as a priority (working with nature to avoid negative impact of grey infrastructures and to achieve various co-benefits i.e. through flood plains, afforestation, ecosystem restoration, etc.)* • *Innovative solutions to water reuse* • *Regulation of zones without any water extraction/water rehabilitation zones (e.g. linked to remaining riparian wetlands and springs from glaciers)* • *Consistency of water investment plans with climate change adaptation strategies* • *Making use of forecasting approaches in water management: Forward-looking assessment of groundwater resources (addressing demand side before considering additional supply)*

[5] https://austriaca.at/0xc1aa5576%200x003a30da.pdf

	and improved consideration of higher water temperatures and low water levels in the management of water resources in all the countries of the river basins.	
Step 2b: Broadening governance structures for effective conflict management **2023-2026**	*Based on step 1, new, respectively more effective alliances for managing water-related conflicts through integrative approaches are established for the identified model river basins, and disseminated into all major Alpine river basins. This includes all larger water users as well as stakeholders that represent the downstream needs. Also, the general public should be integrated into participatory processes to raise awareness on climate-related pressures on Alpine waters. Stakeholders that need to be integrated into this governance structure are mentioned below.*	
Stakeholders needed for implementation	• *Sub-regional, Regional and national administrations (as responsible for implementation of the Water Framework Directive (WFD) and related legislation on water and natural resources)* • *Authorities responsible for spatial planning* • *Organisations for protection of transboundary river basins (e.g. ICPDR) and other coordinators of River Basin Management Plans* • *Authorities responsible for natural resource management and protection, water and nature stewardship organizations* • *Associations and stakeholders related to specific economic water use interests: electricity producers, agricultural sector, recreation and tourism, drinking water suppliers and households, etc.*	
Indicators for monitoring this pathway	• *Map of existing conflicts and model river basins (yes/no)* • *Model projects: number of transboundary model projects* • *Governance structures: Number of Alpine river basins which have climate-resilient transboundary River Basin Management Plans, including broad stakeholder involvement processes*	
Link to other pathways	• *Direct link: IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_SP1: Alpine wide concept „Spatial planning for climate protection; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB members and observers to support the identification of model river basins and to initiate the first steps of projects*
	Governance set-up	• *ACB together with other thematic working bodies to promote water governance processes in Alpine river basins.*
	Twinning/know-how transfer	• *ACB to support twinning approaches between model regions and follow-up activities.*

	Outreach	• *The lessons learnt of the transboundary model regions to be disseminated in all larger Alpine river basins, encouraging transboundary cooperation*
	Knowledge hub	• *Methods for stakeholder involvement processes* • *Methods for creating a common landscape identity for transnational river basins*
Integration in the ACB communication strategy	Content	*Information on results of model regions, lessons learned, etc.*
	Tools	

5.2 IP_W2: Tools and methods for drought management in the Alps

<table>
<tr><td colspan="2">Basic information</td></tr>
<tr><td>Background and description of the pathway</td><td>Due to their generally large water availability and the specific topographical conditions in the Alps, the impacts of climate change on drinking water security will - on an overall level - be less pronounced than in other European regions. However, in combination with seasonal shifts in precipitation and higher evapotranspiration in summer, some regions in the Alps (e.g., inner-Alpine dry valleys, peri-Alpine locations in the South and East, areas with high water needs) are already affected by temporal droughts. These droughts lead to recurring bottlenecks in water supply during dry periods as well as to impacts on hydropower generation and artificial snowmaking due to changing capacities of water reservoirs. In line with climate change projections (changing interactions between glaciers and river water regimes, changing snow distribution and precipitation patterns), it has to be expected that these regions that are already prone to water scarcity will become highly vulnerable drought hotspots in the future (affecting drinking water, process water for industry and SMEs, hydropower generation snowmaking). Thus, a common approach to deal with drought management throughout the Alps seems necessary.
Furthermore, following the approach introduced at EU level by the Water Framework Directive and taking into account SDG 6, the use of the water resources should carefully take into account the water availability in the whole river basin, thus considering also the possible needs and pressures coming from other drought hotspots downstream. Also, it needs to be ensured that drought management measures are in line with the preservation of ecosystems and their services.</td></tr>
<tr><td>Final output</td><td>• Map with drought “hot-spots” under different climate scenarios and water uses which are affected in these hot-spots (drinking and process water, hydropower, artificial snowmaking, ecosystems of the wetlands, agriculture, etc.)
• Early warning systems for water scarcity linked to intervention measures in identified “hotspot” regions
• Concept/recommendations on improving water efficiency and infrastructure for use of raw water/process water and water reuse</td></tr>
<tr><td>Alpine specific character</td><td>As Alpine water systems as well as water uses are closely interlinked across borders, a transnational approach to dealing with threats from droughts and thus to drinking water security seems necessary.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td>Mitigation | | Adaptation | x</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

Start of first implementation step: Now
End of last implementation step: 2050
Starting point already available? yes</td></tr>
<tr><td>Link to target system</td><td>• Direct link: T_E4: Alpine energy democracy/citizen involvement; T_Eco3: Maintained and restored Alpine ecosystem services; T_W1: Alpine-wide optimized water management; T_W2: Drinking water security; T_S2: Enhanced Alpine soil quality; T_RD1: The Alps as model region for vulnerability assessments</td></tr>
</table>

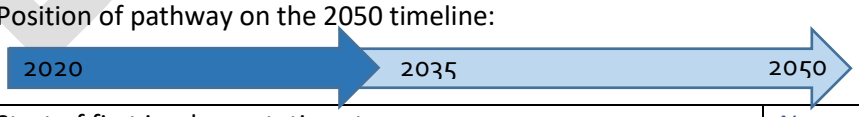
	• *Indirect link: T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_W3: Alpine-wide sustainable flood risk management; T_S1: Minimised land-take and sealing*
Sequence of implementation steps	
Starting point and link to stock-taking	• *RSA2: Water and water management issues (2009)* • *Guidelines on local adaptation to Climate Change for Water Management and Natural Hazards in the Alps (Platform Water Management, 2014) (stock-taking No. 8).* • *Initiative "Strategic planning: How to face drought periods in the Alpine Region" (stock-taking No. 10) and report "Facing droughts in the Alpine region. Experiences, approaches and common challenges" of the Water Platform of the Alpine Convention (2019)* • *Project AlpWaterScarce (stock-taking No. 67)* • *Project C3-Alps – Capitalising Climate Change Knowledge for Adaptation in the Alpine Space (pilot activities in France and Italy; Alpine Space Programme) DriDanube projects and other projects implemented for international river basins.* • *EUSALP AG6 recommendations and good practices on green infrastructure solutions* • *Project ADO (Alpine Drought Observatory), approved and co-financed by the Alpine Space Programme in late 2019*
Step 1: **Hot-spot analysis** **2021-2022**	*Based on the dataset and conflict analysis identified in the pathway "Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management" an Alpine-wide climate impact modelling/assessment approach will identify potential drought "hot-spots" under different climate scenarios, taking into account current climate sensitivity of regional water supply systems. This requires a common methodology as well as the identification of a common threshold on how to identify hot-spots as well as the application of comparable climate scenarios and tools. This hot-spot analysis shall consider that water scarcity can result from different regional characteristics, so that a classification of hot-spots seems necessary (see e.g. AlpWaterScarce recommendations).* *As final output, an interactive map with potential drought hot-spots and an overview on affected water users in these hot-spots under different scenarios and for different timeframes shall be established.*
Step 2a: **Set-up early warning and emergency plan** **2022-2025**	*Based on results in previous projects (see starting points above), early warning systems as well as intervention concepts for these hotspots will be developed.* *Up to now, occurrence of droughts is recognized at a late stage, when the signs become visible and when a drought is already underway. It is thus necessary to develop methods and (short-term/seasonal) forecasting techniques to identify drought situations at an early stage and to trigger relevant measures. The early warning system can be linked to the early warning system for natural hazards (see pathway IP_NH1 "Implementation of an Alpine-wide risk management plan") and should be in line with ongoing activities at EU level[6] as well as adaptation strategies developed at different policy levels.*

[6] E.g. the European Drought Observatory: https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1000

	To trigger effective measures, an early warning system should also include a coordinated emergency plan. This requires the development of an intervention concept including a coordinated prioritisation of water uses and regulatory measures for water saving which come into force at specific tipping points. Such an intervention concept considers the effects that those measures have on ecological services of affected areas. Developing and achieving agreement on these measures will require participatory processes with affected stakeholders and water users.	
Step 2b: Concept for infrastructural measures to reduce consumption of drinking water **2022-2025**	*Careful and economical use of drinking water resources needs awareness-raising on water saving behaviour, but it can also be effectively supported by infrastructural measures. To reduce the consumption of high quality drinking water for non-drinking purposes, such as water toilets and irrigation as well as for artificial snowmaking, separate raw and/or processing water systems should be developed and installed, in particular in "hotspot" regions prone to droughts. This would also reduce the effects of droughts on other water uses.*	
Step 3: Continuous monitoring and re-evaluation of hotspots **2025-2050**	*In order to continuously improve the early warning system and emergency plan, actual drought and water scarcity situations shall be monitored and re-analysed (including information on new demand seasonality, socio-economic data etc.). The early warning system will be improved accordingly.* *In addition, effects of measures of the emergency planning concept will be evaluated to allow a future fine-tuning of measures.*	
Stakeholders needed for implementation	*See pathway IP_W1 "Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management"* *Stakeholders representing industry and SMEs, hydropower generation, nature protection authorities/organizations, agricultural sector, winter tourism and recreation planning, District Authorities with a proper knowledge of the downstream needs.*	
Indicators for monitoring this pathway	• *Hot-spot analysis: qualitative description of results* • *Early warning system and emergency planning: set-up (yes/no), number/percentage of vulnerable Alpine regions which have early warning systems in place.* • *Concept/recommendations for raw/process water systems available*	
Link to other pathways	• *Direct link: IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S3: Supporting measures to preserve and enhance Alpine soil quality IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_NH3: Support measures to enhance individual risk precaution; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *ACB can initiate/coordinate the hot-spot analysis: identify lead partner as well as project team to conduct the analysis.*
	Governance set-up	• *ACB in coordination with other relevant bodies of the AC can trigger the establishment of a*

		consortium to develop blueprints for early warning systems and emergency plans.
	Twinning/know-how transfer	• *ACB can ensure transfer of best practices/experiences with emergency plan (make use and update the stock taking report)*
	Outreach	• *Raise awareness on early warning system and emergency plan*
	Knowledge hub	• *Map with hot-spots could be linked to ACB hub.*
Integration in the ACB communication strategy	Content	*Information on hot-spot analysis, set-up of early warning system, etc.*
	Tools	*Interactive map with hot-spots* *Early warning system and emergency plan.*

5.3 IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions

Basic information	
Background and description of the pathway	*Changing precipitation patterns, especially extreme rainfall events, in combination with changes in snow run-off will lead to changes in flood risk in the Alps. In many regions more frequent and more severe floods risk to cause increasing damage and growing economic losses if no – or the wrong – adaptation measures are taken. Flood hazard zones are likely to extend in many places, while at the same time ongoing expansion of settlements and cumulating economic values increase the damage potential independently of climate change.* *As the Alpine water system is extremely interlinked and many river systems are transboundary, a coordinated flood-risk management which avoids upstream-downstream conflicts needs to be implemented, prioritising as much as possible "nature-based solutions" or "soft" adaptation measures (e.g. "passive flood protection" by means of spatial planning and natural retention areas vs. river engineering and structural protection measures, as well as proper forest management). The advantage in nature-based solutions lies in their flexibility towards different kinds of disaster (different water flow or precipitation patterns, floods as well as droughts).* *Nature-based solutions however are only effective if even selective measures are planned in a coordinated way. Therefore transboundary cooperation is crucial.* *Knowledge on regional natural risks and information on self-empowerment shall be used and spread.*
Final output	• *Recommendations on flood risk management in the Alps with a focus on green/ecosystem-based solutions are disseminated* • *Enhanced transboundary coordination for flood management and exchange of experiences in the Alps*
Alpine specific character	*Alpine water systems are strongly interlinked so that extreme rainfall events can lead to cumulative risks and a common approach to dealing with these risks is necessary.*
Link to mitigation and/or adaptation	Mitigation: Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2030* Starting point already available? *yes*
Link to target system	• *Direct link: T_SP2: Planning systems in risk management changed from passive to proactive; T_E4: Alpine energy democracy/citizen involvement; T_NH1: Alpine risk management; T_Eco1: Preserved ecosystems and biodiversity; T_Eco3: Maintained and restored Alpine ecosystem services; T_W1: Alpine-wide optimized water management; T_W3: Alpine-wide sustainable flood risk management; T_S1: Minimised land-take and sealing; T_RD1: The Alps as model region for vulnerability assessments*

	• *Indirect links: T_NH3: Individual risk precaution; T_Eco2: Alpine-wide system of protected areas; T_Eco4: Alpine ecological connectivity; T_Fo1: Potential of protective mountain forests fully used; T_W2: Drinking water security; T_S2: Enhanced Alpine soil quality*
Sequence of implementation steps	
Starting point and link to stock-taking	• *RSA7: Natural Hazards Risk Governance* • *Alpine Strategy for the adaptation to climate change in the field of natural hazards* • *Guidelines on local adaptation to climate change for water management and natural hazards in the Alps* • *EUSALP AG6 Green infrastructure solutions for an integrated and sustainable water management. Recommendations and good practices* • *Project SPARE - Strategic Planning for Alpine River Ecosystems (Alpine Space Programme)* • *Project AdaptAlp – Adaptation to climate change in the Alpine Space (Alpine Space Programme)* • *Project CLISP – Climate Change Adaptation by Spatial Planning in the Alpine Space (Alpine Space Programme)* • *Compliance with the Flood Directive* • *Considering the Flood Risk Management Plans of the EU Member States*
Step 1a: Dissemination of recommendations for Green(er) Infrastructure **2021-2025**	*For instance the document "Green infrastructure solutions for an integrated and sustainable water management - Recommendations and good practices", adopted by EUSALP in 2019, already compiles good practice examples from Alpine countries and highlights recommendations for different types of rivers, with a specific focus on the dilemma of climate change adaptation needs and spatial pressure in the Alps.* *This document, as well as further already existing recommendations, can be adapted for use under the Alpine Convention and disseminated by integrating it into the agendas of different regional workshops already happening in the Alps.*
Step 1b: Application of recommendations for specific model cases **2021-2025**	*Ongoing planning processes for flood management on Alpine rivers will be identified, and discussions started on how those could take into account the recommendations (see Step 1a).* *At the same time, better coordination of planning activities in all countries of transboundary rivers are promoted by ACB members and respective representatives of the Alpine Convention Contracting Parties.*
Step 1c: Enhance better cooperation between countries on transboundary rivers **2021-2025**	*At the same time, better coordination of planning activities in all countries of transboundary rivers is promoted by ACB members and respective representatives of the Alpine Convention Contracting Parties. This allows for a larger planning frame on the spatial level, and therefore enhanced effectiveness of the individual measures.*
Step 2: Extension of early warning system on floods **2025-2030**	*Floods are one of the most common natural hazard in the Alps. In cooperation with the pathway "IP_NH1: Implementation of an Alpine-wide risk management plan on natural hazards", it will be checked how flood prevention measures can be integrated in the early warning system.*

Stakeholders needed for implementation	*Public authorities (flood risk management, water management, forest management, civil protection, spatial planning, nature conservation) at local, regional and national level* *Municipalities* *Involvement of local and regional citizens (risk governance approaches)*	
Indicators for monitoring this pathway	• *Increased awareness for nature-based solutions at national, regional and local level* • *number of flood management plans the recommendations are applied to* • *number of transboundary rivers with increased coordination of the flood management planning*	
Link to other pathways	• *Direct link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_NH3: Support measures to enhance individual risk precaution; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Best practices: ACB together with other relevant bodies of the AC and the PSAC adapts the existing recommendations for AC needs ACB members identify and take opportunities for dissemination of the recommendations*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to implement recommendations* • *AC supports interlinkage of flood management planning as well as early warning systems*
	Twinning/know-how transfer	• *Bottom-up initiatives as developed within the network as well as the pilot projects should be assisted through partners in ACB, e.g. members of the ACB support application of nature-based approaches in flood planning* • *Members of ACB or other Alpine Convention bodies can use contacts within their country/region to extend the approach.*
	Outreach	-
	Knowledge hub	*Knowledge hub of ACB can be used for disseminating information on best practices. Also, a platform/sharepoint for existing flood risk coordinators could be linked to the hub.*
Integration in the ACB communication strategy	Content	*Information on best practices, pilot projects, early warning systems.*
	Tools	*Early warning system could be linked to ACB hub.*

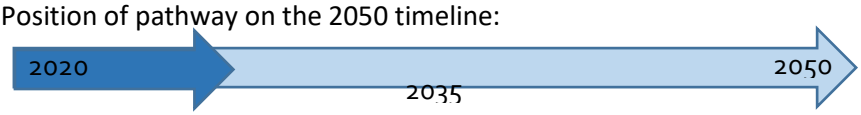
A6. Spatial Planning

6.1 IP_SP1: Alpine wide concept „Spatial planning for climate protection"

Basic information				
Background and description of the pathway	*The task of spatial planning is to coordinate and balance different land uses in a way that respects ecological, economic and social needs. In the context of climate change in the Alps, these ecological needs are no longer restricted to the Alps, but acquire a global dimension. In regard to settlement and transport infrastructure, spatial planning also means planning for inhabitants, visitors and businesses to facilitate their activities in rational and efficient spatial structures and connections. Spatial planning therefore aims at sustainably using resources taking into account changing conditions (i.e. climate change). This cross-cutting issue seems like a framework for many actions connected to climate adaptation and climate mitigation and is reflected in the Roadmap to a Resource Efficient Europe[7] and its vision of no net land-take by 2050.* *Further, climate change increases the spatial pressure on so-far unspoiled, natural high Alpine areas, especially for ski resort expansion and water reservoirs (for artificial snow as well as hydropower) but also for agriculture in the law-land/valleys to prevent water scarcity.*			
Final output	• *Harmonised statistical data on land-consumption and Net0[8]* • *Overview of impact of climate scenarios on land use* • *Survey on land saving targets and challenges* • *Collection of good practices for growth and shrinking strategies* • *Recommendations for the biggest challenges and opportunities/approaches to overcome them* • *Guidance on "Spatial planning for climate protection" for municipalities of the perimeter of the Alpine Convention*			
Alpine specific character	*The area of permanent settlement is very limited in most parts of the Alps. Promoting spatial structures focusing on this challenge and, at the same time, being in line with the transformation towards climate-neutrality seems to be crucial. An Alpine wide concept that assigns spatial planning a key role for climate protection in the Alpine area would be a great challenge on the one hand but could also offer a big pool of opportunities for climate action on the other hand. In most Alpine countries, municipalities play a critical role in spatial development and the implementation of spatial planning objectives. Defining recommendations for sustainable spatial structures at this level is an essential part.*			
Link to mitigation and/or adaptation	Mitigation	x	Adaptation	x

[7] COM(2011) 571

[8] Neto means maximum use of land that has already been built on or sealed, avoidance of re-construction of soils. Unavoidable additional land take requires equivalent compensation by returning formerly built-up land to cultivated land or natural area. (http://ec.europa.eu/environment/integration/research/newsalert/pdf/no_net_land_take_by_2050_FB14_en.pdf , https://www.umweltbildung.at/cms/praxisdb/dateien/485_pdf.pdf)

<table>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

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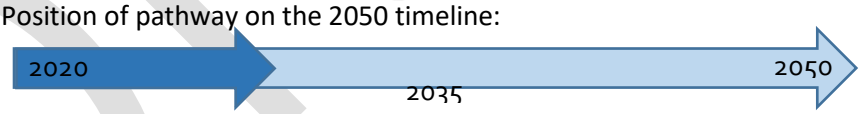
<tr><td>Link to target system</td><td>Direct link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_SP2: Planning systems in risk management changed from passive to proactive; T_E5: Climate proofed Alpine hydropower; T_Tr1: Modal shift of Alpine freight transit; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco4: Alpine ecological connectivity; T_W3: Alpine-wide sustainable flood risk management; T_S1: Minimised land-take and sealing; T_MA1: Municipalities as transition engines; T_MA2: Climate action institutionalized in municipal action
Indirect link: T_Tr3: Reduced transport demand (passenger and freight); T_NH1: Alpine risk management; T_Tou1: Car-free, attractive tourism traffic; T_Eco3: Maintained and restored Alpine ecosystem services; T_Fo1: Potential of protective mountain forests fully used; T_S2: Enhanced Alpine soil quality</td></tr>
<tr><td colspan="2">Sequence of implementation steps</td></tr>
<tr><td>Starting point and link to stock-taking</td><td>Project ESPON Alps 2050 (https://www.espon.eu/Alps2050)
Links4Soils (Stock taking No 77) and Alpine Soil Partnership with the Alpine Soil Platform (database)
Activities of EUSALP AG6 (toolbox “less land-take”, declaration on “Sustainable Land Use and Soil Protection”, new work programme in 2020)
Climate Communication measures of ALPACA
Impuls4Action (“From intelligent Landuse to sustainable municipalities”, cross national project of Alpine states)
ESPON SUPER - Sustainable Urbanization and land-use Practices in European Regions (https://www.espon.eu/super)
ASP CLISP project (common spatial planning strategy for climate adaptation); http://www.alpine-space.org/2007-2013/projects/projects/detail/CLISP/show/index.html#project_outputs and https://www.bmlrt.gv.at/english/environment/Climateprotect/Austrian-Strategy-for-Adaptation-to-Climate-Change.html)
Project “Open Space Alps” (Alpine Space programme): dealing with unspoiled high Alpine areas
National strategic goals; e.g. New Spatial Development Strategy for Slovenia (target 0% net land-take by 2050)</td></tr>
<tr><td>Step 1a: Definition and provision of data concerning the impact of</td><td>Statistical data on land-consumption and Net0 based at municipal level shall be harmonised across the Alps. Further, data on the impact of climate scenarios (precipitation, temperatures) on the land use shall be provided where they have a cross-border relevance, e.g. the impacts on cross-border infrastructure, energy production, settlement development.</td></tr>
</table>

climate scenarios on land use **2021-2023**	
Step 1b: **Collection of good practices for growth and shrinking strategies** **2022**	*Collect good practice examples for growth and shrinking strategies in the Alpine area and publish the collection. These examples are the starting point for the moderated discussion (Step 3b).*
Step 1c: **Moderated discussion about growth and shrinking strategies** **2022-2025 (ongoing)**	*Start a moderated discussion about growth and shrinking in the Alpine area. The consolidation of spatial structures is needed as well as making deconstruction and healthy shrinking imaginable/attractive as a solution.*
Step 2:Exchange and dissemination of information and awareness raising **2021-ongoing**	*An exchange of information on the link between climate protection and spatial planning is needed. Make use of the communication and awareness raising campaign "Soil protection is climate protection and vice versa" of pathway IP_S1 (Soil) to communicate the connection between land-take and loss of soil, the limited availability of land as a resource, and the role of soil as carbon sink and the climate-protection-related benefits of containing sprawl, e.g. the possibility to provide regional food products.*
Step 3: **Survey on land saving targets and challenges** **2021-2023**	*Which states/countries have adopted land saving targets (or are discussing them) and what are the biggest challenges to reach these aims? An Alpine wide survey shall give answers to these questions.*
Step 4: **Guidance for municipalities**	*Municipalities are playing a key role in the development of spatial structures. A guidance for municipalities in the Alpine Convention Perimeter to analyse their potential for sustainable land use shall be developed based on existing approaches and tools. Internal development potential and balance of building land are crucial topics. To foster the exchange, best practices from Mayor to Mayor should be collected and disseminated (for instance via conferences or a twinning system).*

2022-2024		
Step 5: **Recommendations for the biggest challenges** **2024-2025**	*Secondary residences, vacancies, priority areas / crop rotation areas and brown fields, access to inner-urban development potential, benefits of land saving resp. densification vs. urban sprawl, donut-effect vs. strengthening the town centre, touristic infrastructure … the biggest challenges defined in step 2 shall be collected. Experts on the national level meet, discuss and generate transferable recommendations to overcome those challenges.*	
Stakeholders needed for implementation	• *Observer organisation and NGOs (e.g. Alpine Town of the year Association, Alliance in the Alps (AidA), CIPRA, WWF)* • *Working Group on Soil Protection, Ad-hoc Expert Group on Spatial Planning, and other (former) Working Groups and Boards of the Alpine Convention* • *EUSALP AG6 and AG7* • *Spatial planner* • *Decision makers at local and regional level* • *Stakeholders of the Alpine Soil Partnership / Links4Soils* • *Network ALPACA for communication and coordination*	
Indicators for monitoring this pathway	• *Alpine wide definition of key terms like land-consumptions and Net0 (y/n)* • *Survey on land saving targets and challenges (y/n)* • *Alpine wide publication on impact of climate scenarios on land use (y/n)* • *Published collection of good practices for growth and shrinking strategies (y/n)* • *At least one exchange workshop on the topic of growth vs. shrinking (y/n)* • *Written recommendations for the biggest challenges and opportunities/approaches to overcome them (y/n)* • *Guidance for municipalities of the perimeter of the Alpine Convention (y/n)*	
Link to other pathways	• *Direct link: IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_NH3: Support measures to enhance individual risk precaution; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions; IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to	Implementation	• *ACB together with other thematic working bodies of the AC collects saving targets and challenges for the survey.*

implement the pathway		• *An expert group on spatial planning frames a moderated discussion on options of growth and shrinking options in the Alpine area.*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to the harmonisation of statistical data on land-consumption and Net0 and support awareness raising campaigns.* • *AC National Focal Points call on national and regional authorities to communicate the reduction of land-take and growth and shrinking options in a more open way.*
	Twinning/know-how transfer	• *Support cooperation between Links4Soils/Alpine Soil Partnership, the AC Ad-hoc Expert Group on Spatial Planning, the AC Working Group on Soil Protection, the experts working on the topic of spatial planning in the Alps (ESPON)* • *Members of ACB or other Alpine Convention bodies use contacts within their country/region to extend the communication on land-consumption.* • *Especially Alliance in the Alps (AidA) and the Alpine Town of the Year Association build a bridge to the municipality level which plays a crucial part in the context of spatial planning.*
	Outreach	• *ACB can be part of the awareness raising and communication campaign on "soil protection is climate protection and vice versa".* • *ACB can facilitate that recommendations are offered in response to challenges identified*
	Knowledge hub	• *The knowledge hub of the ACB can be used as a pool of information about statistical data on land-consumption etc., as well as for guidelines, collection of best practices, challenges and recommendation.*
Integration in the ACB communication strategy	Content	*Share the definition of land-consumption; address mayors via Observer organisations (especially via AidA and Alpine Town of the Year Association); enable open discussion about shrinking and growing.*
	Tools	-

6.2 IP_SP2: Spatial planning measures for reducing the need of individual car traffic

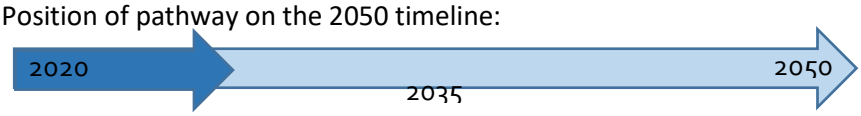
Basic information	
Background and description of the pathway	*Many spatial planning systems and strategies at transnational, national and regional level (legal and institutional framework, instruments, procedures including in cross-border regions) already give a strong priority to climate change considerations, including mitigation and adaptation aspects. A crucial point in the discussion concerning the mitigation aspect is to foster spatial structures that reduce the need for individual car traffic.*
Final output	• *Best practice collection on accessibility* • *Guidelines for attractive mobility interfaces* • *At least one pilot region in each Alpine country (micro transport, public transport, new technologies in the mobility sector)* • *Concept/Feasibility study for an Alpine Ticket or Advantage Card (Vorteilscard Alpen)*
Alpine specific character	*Some parts of the Alps are densely populated, some scarcely. Some mobility needs of inhabitants are difficult to influence, they sometimes even increase. To reduce individual car traffic, spatial planning measures should be improved to promote efficient public-transport service provision and cycling and these modes of transport must be made more convenient and promoted as an attractive alternative.*
	Mitigation:	x	Adaptation:
Implementation timeframe	Position of pathway on the 2050 timeline: 
	Start of first implementation step: *Now* End of last implementation step: *2028* Starting point already available?: *yes*
Link to target system	• *Direct link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_E5: Climate proofed Alpine hydropower; T_Tr3: Reduced transport demand (passenger and freight); T_Tou1: Car-free, attractive tourism traffic; T_S1: Minimised land-take and sealing; T_MA1: Municipalities as transition engines; T_MA2: Climate action institutionalized in municipal action* • *Indirect link: -*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Interrail Ticket, Youth Alpine Interrail initiative (CIPRA International)* • *SaMBA - Sustainable Mobility Behaviours in the Alpine Region (Project consortium under lead of Regione Piemonte)* • *AlpInfoNet project (Bavarian Ministry of the Interior, for Building and Transport and further partners, Transport Working Group)*

	• *Mobility solutions in the Alps Database (Transport Working Group)* • *klimaaktiv mobil - Mobility management for leisure and tourism (Austria)* • *MOR€CO-project (Alpine Space Programme 2007-2013) – mobility and residential costs. Project results include a tool for assessing mobility and residential costs (e.g. for Greater Munich, the State of Salzburg)*
Step 1: **Definition of expectations and** **2021**	*In a first step, expectations towards sustainable mobility in the Alps shall be defined. For instance: Which expectation raise from labels (e.g. mountaineering villages?) What does sustainable mobility mean?*
Step 2: **Best practice collection on accessibility solutions** **2021-2022**	*Based on the defined expectations best practice examples on accessibility solutions in densely and scarcely populated areas of the Alps shall be collected. Further topics to be discussed in this step are grades for the quality of accessibility and parking space regulations.*
Step 3a: Guidelines for attractive mobility interfaces **2023-2025**	*Define guidelines for more attractive interfaces in order to make the transfer by public transport and intermodal transport chains more attractive by matching departure times, offer shopping opportunities and social infrastructure at the stops and transfer points.*
Step 3b: **Pilot regions for micro transport, public transport and new technologies** **2022-2025**	*Establish at least one pilot region in each Alpine state to expand micro transport (scooters, bikes) and public transport as well as the use of new technologies in the mobility sector.*
Step 4: **Alpine Ticket** **2025-2028** **(ongoing)**	*Develop an Alpine Ticket – for instance like the Ticino ticket – to promote the use of public transport in the whole Alpine area. For one overnight stay you get a ticket for the public transport system financed by visitor's tax. Also an Advantage Card for the use of public transport in the Alps (Vorteilscard Alpen) could be an option.*
Stakeholders needed for implementation	• *Working Group on Transport (AC), Ad-hoc Expert Group Spatial Planning and Action Group 4 on Mobility (EUSALP)* • *Spatial planner and transport planner* • *Supplier of public transport*

Indicators for monitoring this pathway		• *Best practice collection on accessibility (y/n)* • *Guidelines for attractive mobility interfaces (y/n)* • *At least one pilot region in each Alpine state (micro transport, public transport, new technologies in the mobility sector) (y/n)* • *Alpine Ticket (y/n)*
Link to other pathways		• *Direct link: IP_Tr2: Developing the Alps into a model-region for reduced working mobility; IP_Tr4: Developing the Alps into a model region for shared mobility; IP_SP1: Alpine wide concept „Spatial planning for climate protection"* • *Indirect link: IP_Tr3: Developing an Alpine-wide approach towards integration and decarbonisation of public transport; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_S3: Supporting measures to preserve and enhance Alpine soil quality*
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *A Thematic Working Body of the AC (Working Group on Transport) collects accessibility solutions for densely and scarcely populated areas.* • *The ACB supports the establishment of pilot regions for micro transport, public transport and new technologies.* • *AC National Focal Points actively support the development of an Alpine Ticket by referring to successful implementation projects (Interrail, Youth Alpine Interrail, and Ticino Ticket).*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to make us of the best practice collection and the guidelines.*
	Twinning/know-how transfer	• *Support cooperation between stakeholders – especially supplier of public transport and spatial planner.*
	Outreach	• *ACB spreads the outcomes and informs about guidelines for attractive mobility interfaces, solution in the sector of micro transport, public transport, cycling and new technology.* • *AC actively communicates the idea of the Alpine Ticket.*
	Knowledge hub	• *The knowledge hub of the ACB can be used for collecting information on expectations towards sustainable mobility in the Alps, best practice collections and guidelines.*
Integration in the ACB communication strategy	Contents	*Spread the outcome of this step – especially focus on the Alpine Ticket.*
	Tools	-

A7. Soil

7.1 IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands

Basic information	
Background and description of the pathway	*Soil is an important carbon pool. The preservation of soil is crucial, because only healthy soils can store the carbon. The sequestration of carbon in soil organic matter is one of the main climate mitigation strategies for removing global-warming carbon dioxide (CO_2) from the atmosphere. Soil carbon sequestration is a process whereby CO_2 is removed from the atmosphere by vegetation, and stored in the soil's pool of organic carbon.*[9] *"Soil protection is climate protection and vice versa" is a core message. On the one hand there is the need for an awareness raising campaign for soil, especially for C-rich soils like peatland, moorland, wetland in the Alpine area. On the other hand famers, land managers, foresters, spatial planners and decision makers on the international, national, regional and local level shall be coached to protect soils and to give priority to cultivation measures which maintain/restore carbon stock in soils.*
Final output	• *Alpine-wide comparable soil classification systems (or integration of Alpine soils characteristic into the world reference base of soils*[10]*)* • *Cross border soil maps in the Alps* • *Comprehensive soil survey, especially in high elevation of the Alps* • *Recommendations for measures to preserve and increase carbon stock in soils and for the protection and/or rehabilitation of peatlands, moorlands and wetlands* • *Alpine wide soil protection network with regular exchange on topics such as preservation and increase of carbon stock in soils and to the protection and/or rehabilitation of peatlands, moorlands and wetlands* • *Alpine wide awareness raising campaign for protection of soils and importance of carbon stock in soil*
Alpine specific character	*Alpine soils are highly vulnerable – they are strongly affected by threats related to climate change and land use change etc.* *An increase of knowledge about Alpine soils and exchange between stakeholders from the Alpine states – especially on the topic of carbon stock – is needed.*
Link to mitigation and/or adaptation	Mitigation: x Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline: 

[9] https://ec.europa.eu/jrc/en/science-update/how-soil-organic-matter-composition-affects-carbon-sequestration

[10] http://www.fao.org/soils-portal/soil-survey/soil-classification/world-reference-base/en/

	Start of first implementation step	*Now*
	End of last implementation step	*2025*
	Starting point already available?	*yes*
Link to target system	• *Direct link: T_Eco3: Maintained and restored Alpine ecosystem services; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_S2: Enhanced Alpine soil quality; T_MA3: Networks of CO_2-free municipalities; T_RD1: The Alps as model region for vulnerability assessments; T_RD3: Alpine-wide climate-data availability* • *Indirect link: T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Fo2: Mountain forests as carbon sink; T_S1: Minimised land-take and sealing*	
Sequence of implementation steps		
Starting point and link to stock-taking	• *Links4Soils (Stock taking No 77) and Alpine Soil Partnership with the Alpine Soil Platform (website)* • *ALPENHUMUS (German initiative that aimed at detecting effects of current climate change on C-storage in humus layers in the Alps; Stock taking No 87)* • *In depth revision on the topic "Economical use of soil" of the Compliance Committee of the Alpine Convention* • *Activities of EUSALP AG6 (declaration on "Sustainable Land Use and Soil Protection", toolbox "less land-take", new work programme in 2020)* • *Climate Communication measures of ALPACA* • *Impuls4Action ("From intelligent Landuse to sustainable municipalities", cross national project of Alpine states)* • *LUCAS (https://esdac.jrc.ec.europa.eu/projects/lucas)* • *Carbon calculator* • *ACRP Projekt CASAS (Carbon sequestration in Austrian soils)* • *Rural Development Programmes in the Alpine Countries* • *Literature on soil classification and mapping in the Alps*[11] • *Global Soil Organic Carbon Map (http://www.fao.org/global-soil-partnership/pillars-action/4-information-and-data-new/global-soil-organic-carbon-gsoc-map/en/)*	
Step 1a: Develop an Alpine-wide soil classification system **2021-2023**	*Develop a classification system for soils in the Alpine area, based on a common agreement on soil types (especially C-rich soil types like peatlands, moorlands and wetlands). Alternative options are the integration of Alpine soils characteristic to the world reference base or generating translators of the various national soil classification systems.*	
Step 1b: **Foster exchange between initiatives**	*Foster the exchange between and mutual enhancement of Alpine initiatives that aim at protecting or rehabilitating soils, with a special focus on the classification system of step 1a Exchange formats can be workshop sessions in an international context as well as small peer group*	

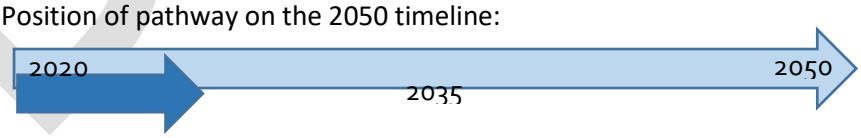
[11] *e.g. Baruck et al (2016): Soil classification and mapping in the Alps; the current state and future challenges; Geoderma 264 Part B; 312-331*

aiming at soil protection **2021-2023**	*meetings of experts / scientist / people from the administrative level etc. Especially initiatives like the Alpine Soil Partnership and Link4Soils carry great knowledge and experiences.*
Step 2a: Communicate the need for soil protection **2021-2025** **(ongoing)**	*Start an Alpine wide awareness raising and communication campaign and focus on the message "Soil protection is climate protection and vice versa". Make use of the workshops of Alpine initiatives (Step 1) to speak with one voice about challenges and need for action to protect soil to protect climate.*
Step 2b: Map carbon rich soil types (pilot projects) **2023-2025**	*Implement a classification system (as developed in Step 1a): Survey to close soil survey gaps, especially at higher elevations and produce a map of Alpine soils, where carbon rich soil types like moorlands, wetlands and peatlands – also potential areas – can be identified. This should be done, in a first step, in at least one cross border region of the Alpine perimeter. Use the Alpine wide initiatives to communicate the results of mapping.*
Step 3a: Recommendations on prevention, protection and compensation measures **2022-2025**	*Collect best practices for prevention, protection and compensation measures and define recommendations for the protection, redevelopment and rehabilitation of moorlands, wetlands and peatlands; those prevention, protection and compensation measures should have a clear focus: maintain and restore carbon stock in soil and reactivate peatlands.*
Step 3b: **Pilot project on prevention, protection and compensation measures** **2023-2025**	*Implement a pilot project in a cross border region of the Alpine perimeter (Step 2b) to apply the recommendations (Step 3a).*
Stakeholders needed for implementation	• *Working Group on Soil Protection of the Alpine Convention* • *EUSALP AG6Stakeholders of the Alpine Soil Partnership/Links4Soils* • *Agents for Soil protection on the international, national, regional and local level (and their networks like ELSA, ENSA, Fachbeirat für Bodenfruchtbarkeit und Bodenschutz – Committee on soil fertility and soil protection)* • *Decision makers at international, national, local and regional level* • *Alpine initiatives for the protection and/or rehabilitation of peatlands, moorlands and wetlands*

		• *Alliances of farmers, foresters and land managers* • *Scientific community (e.g. University Innsbruck, Boku Vienna)* • *Spatial planners* • *National land mapping institutes like BFW in Austria* • *JRC (Joint Research Centre) of the European Commission* • *Network ALPACA for communication* • *Authorities responsible for Natura2000 implementation*
Indicators for monitoring this pathway		• *Alpine wide initiatives to protect or rehabilitate peatlands, moorlands and wetlands (y/n)* • *Pilot actions: Map of carbon rich soil types as defined in step 1* • *One pilot project in a cross border region of the Alpine perimeter to apply the recommendations for compensation measures (y/n)* • *List of recommendations for prevention, protection and compensation measures (y/n)* • *One communication product in each Alpine state that spreads the message "Soil protection is climate protection and vice versa" (y/n)*
Link to other pathways		• *Direct link: IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Fo3: Accelerate forest conversion to more resilient ecosystems*
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Frame a discussion on an Alpine-wide soil classification system (for instance within Working Group on Soil Protection of the AC).* • *Define cross border regions for a mapping of carbon rich soil types.*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to support awareness raising campaigns.*
	Twinning/know-how transfer	• *Support cooperation between Links4Soils/Alpine Soil Partnership and the AC Working Group on Soil Protection.* • *Members of ACB or other Alpine Convention bodies use contacts within their country/region to extend the communication on soil protection.*
	Outreach	• *ACB can be part of the awareness raising and communication campaign on "soil protection is climate protection and vice versa".* • *ACB can facilitate that results of pilots are transferred to other interested municipalities (e.g. via observer).*
	Knowledge hub	• *The knowledge hub of the ACB can be used for communicating classification system for soils in the Alpine area as well as for collecting best*

		practices on recommendations for prevention, protection and compensation measures.
Integration in the ACB communication strategy	Content	*Spread the message "soil protection is climate protection and vice versa."*
	Tools	*Newsletters of the AC, link to Observers dealing with soil protection*

7.2 IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing

<table>
<tr><th colspan="2">Basic information</th></tr>
<tr><td>Background and description of the pathway</td><td>No more additional (net) land-take, land sealing and strengthened approaches of brown field re-development by 2050– these are three key elements for the protection of soils and their ecosystem services with respect to climate mitigation and adaptation. Soils can be destroyed easily, but it takes a very long time to regenerate soil, if it is possible at all. This applies especially to high altitude areas, where soil development processes are taking place even slower. The transition towards climate-neutral and climate-resilient Alps requires an Alpine wide understanding of the importance of minimised land-take and sealing and redevelopment of brownfields.</td></tr>
<tr><td>Final output</td><td>Definition of land-take/land sealing, brownfield redevelopment
Common understanding for monitoring of land-take and land sealing
Recommendations for an economic incentive system that stimulates efforts to minimize land-take and sealing.
Guidelines for land use planning at municipal level
Workshops and information events for stakeholder at the municipal level</td></tr>
<tr><td>Alpine specific character</td><td>The core Alpine area is subject to specific challenges such as a very limited permanent settlement area, with highly productive soils, combined with an increasing demand for space for transport, housing, economic activities and leisure. This is implicating land-take and often soil sealing leading to loss of those soils and considerable pressure on sensitive ecosystems etc. Those challenges affect not only one Alpine state – they are cross border issues and a common urgency. Alpine wide guidelines for minimised land-take and sealing shall be a corner stone to overcome these challenges.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td>Mitigation | x | Adaptation | x</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

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<tr><td>Link to target system</td><td>Direct link to: T_Eco1: Preserved ecosystems and biodiversity; T_Eco4: Alpine ecological connectivity; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_S1: Minimised land-take and sealing; T_MA1: Municipalities as transition engines</td></tr>
</table>

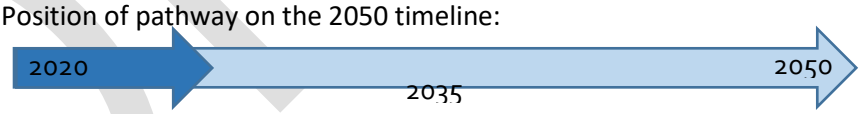
	• *Indirect links to: T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_S2: Enhanced Alpine soil quality*
Sequence of implementation steps	
Starting point and link to stock-taking	• *In depth revision on the topic "Economical use of soil" of the Compliance Committee of the Alpine Convention* • *Links4Soils (Stock taking No 77) and Alpine Soil Partnership with the Alpine Soil Platform (website)* • *Activities of EUSALP AG6 (declaration on "Sustainable Land Use and Soil Protection", toolbox "less land-take", new work programme in 2020)* • *Climate Communication measures of ALPACA* • *Impuls4Action ("From intelligent Landuse to sustainable municipalities", cross national project of Alpine states)* • *Working Group on Soil Protection of the Alpine Convention* • *No net land-take by 2050 (European Commission)* • *Project OpenSpaceAlps (2019-2021)* • *Indicator Land-take in Europe (https://www.eea.europa.eu/data-and-maps/indicators/land-take-3/assessment)* • *ESPON SUPER – applied research project:* https://www.espon.eu/super
Step 1: **Define land-take/land sealing and the need to stop both** **2021**	*.Reach common understanding in Alpine countries about the economical use of soil and the reduction of land use. Therefore operate with an Alpine wide definition and shared understanding of monitoring of land-take and land-sealing (definition proposal developed in the frame of the in depth review of the Compliance Committee of the Alpine Convention "Economical use of soil").*
Step 2a: **Use and spread exiting data on soil quality and function** **2021-2022**	*Compile, make use of and spread the data collection of soil quality and soil function (pathway IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands) and consider information on soil quality and function for spatial planning decisions.*
Step 2b: **Coaching of spatial planners** **2021-2022**	*Empower the discipline of spatial planning and involving the spatial planning sector in decisions regarding land-take and sealing in all Alpine countries. A key elements are to foster communication about the importance of spatial planning as tool for soil protection and that also data of soil quality and functions should be considered in spatial planning.*

Step 2c: **Alpine wide recommendations for an economic incentive system** **2022-2024**	*Alpine wide recommendations for an economic incentive system (e.g. tradeable land planning permits[12], subsidies for land unsealing) which include both net new land-take (e.g. for new infrastructures) but also land regeneration shall be made. These recommendations shall be made on the basis of a review of existing economic incentive systems for land-take in the Alpine countries and beyond.*
Step 3: **Define guidelines for land use plans at the municipal level** **2024-2026**	*Define guidelines for land use plans at the municipal level (land-take and urban regeneration), including strategic action in land planning as well as small-scale measures for soil sealing reduction.*
Step 4: **Communicate and spread guidelines for land use plans** **2026-2028**	*Stakeholders at the municipal level play a key role when it comes to the implementation of guidelines for land use plan. Workshops and Information events shall be organized in the perimeter of the Alpine Convention.*
Stakeholders needed for implementation	• *Working Group on Soil Protection of the Alpine Convention* • *Stakeholders of the Alpine Soil Partnership/Links4Soils* • *Agents for Soil protection on the international, national, regional and local level (and their networks)* • *Decision makers at local and regional level (mayors)* • *Scientific community (e.g. TU Vienna, Boku Vienna)* • *Spatial planner (e.g. national networks like ÖROK in Austria)* • *Stakeholders from all sectors (building, traffic, economy, agriculture and forestry, nature conservation etc.)* • *All those active in the Spatial planning pathways*
Indicators for monitoring this pathway	• *Alpine wide definition of land-take/land sealing (y/n)* • *Recommendations for an economic incentive system (y/n)* • *Guidelines for land use plans at the municipality's level (y/n)* • *Workshops and information events for stakeholder at the municipal level in every Alpine country (y/n)*
Link to other pathways	• *Direct link: IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas* • *Indirect link: IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_E4: Supporting Alpine administrations as*

[12] For further information please refer to: https://www.umweltbundesamt.de/en/topics/soil-agriculture/land-use-reduction/tradable-land-planning-permits#textpart-

		forerunners & models for the energy transition on their premises; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_NH3: Support measures to enhance individual risk precaution; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S3: Supporting measures to preserve and enhance Alpine soil quality
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *AC National Focal Points call on national and regional authorities to make use of the Alpine wide definition of land-take/land sealing and the need to stop both* • *The AC National Focal Points call on regional and local authorities to organize workshops and information events to communicate and spread guidelines for land use plans.*
	Governance set-up	· -
	Twinning/know-how transfer	• *ACB members can support the exchange of information on soil and spatial planning between AC Working Group on Soil Protection, EUSALP AG6 (foreseen activities oriented on inner development) and others*
	Outreach	• *Spread information on Alpine-wide recommendations on economic incentive system as well as guidelines on land-use plans.*
	Knowledge hub	*The knowledge hub can be used for providing information on the tradeable permit system.*
Integration in the ACB communication strategy	Contents	*Definition of land-take and land sealing; brainstorming on guidelines for land use plans and communicating the results*
	Tools	*Newsletters of the AC, link to Observers dealing with soil protection*

7.3 IP_S3: Supporting measures to preserve and enhance Alpine soil quality

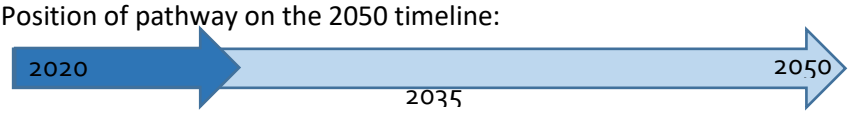
Basic information	
Background and description of the pathway	*Soils are multifold biotopes; among other functions soils can help to protect the climate through carbon sequestration. The Alpine Conference decided to take upon action in the field of soil protection to reach the following goals by 2050: "There is no more additional (net) land-take and land sealing. Brown field re-development approaches have been strengthened to protect Alpine-specific soils and their services." (XV Alpine Conference 2019)* *Use land in a way appropriate for the soil functions and protect highly functional soils – this is a key factor for enhancing soil quality. In the following 3 steps, measures to enhance Alpine soil quality shall be implemented.*
Final output	• *Alpine wide definition and data collection on soil quality* • *Analysis of hot-spots of productive and especially valuable soils with soil function maps* • *Management recommendations for valuable soil types*
Alpine specific character	*Soil is a finite, non-renewable and endangered natural resource. Especially Alpine soils are highly vulnerable – they are strongly affected by threats related to climate change, land use change etc. Preserving and enhancing Alpine soil quality is a key challenge of soil protection in the Alpine area.*
Link to mitigation and/or adaptation	Mitigation: x; Adaptation: x
Implementation timeframe	Position of pathway on the 2050 timeline:  Start of first implementation step: *Now* End of last implementation step: *2025* Starting point already available?: *yes*
Link to target system	• *Direct link: T_Eco3: Maintained and restored Alpine ecosystem services; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_S2: Enhanced Alpine soil quality; T_MA3: Networks of CO_2-free municipalities; T_RD1: The Alps as model region for vulnerability assessments; T_RD3: Alpine-wide climate-data availability* • *Indirect link: T_Fo2: Mountain forests as carbon sink; T_S1: Minimised land-take and sealing*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Links4Soils (Stock taking No 77) and Alpine Soil Partnership with the Alpine Soil Platform (database)*

	• *ALPENHUMUS (German initiative that aimed at detecting effects of current climate change on C-storage in humus layers in the Alps; Stock taking No 87)* • *In depth revision on the topic "Economical use of soil" of the Compliance Committee of the Alpine Convention* • *Activities of EUSALP AG6 (declaration on "Sustainable Land Use and Soil Protection, "toolbox "less land-take", new work programme in 2020)* • *LUCAS (https://esdac.jrc.ec.europa.eu/projects/lucas)* • *H2020 project LANDMARK (www.landmark2020.eu)* • *ACRP Projekt CASAS (Carbon sequestration in Austrian soils)* • *Impuls4Action ("From intelligent Landuse to sustainable municipalities", cross national project of Alpine states)* • *Working Group on Soil Protection of the Alpine Convention* • *Agri-environmental programmes in the Alpine countries (e.g. ÖPUL in Austria)* • *4 per 1000 Initiative (https://www.4p1000.org/)*
Step 1: **Alpine wide monitoring of soil quality and hot-spot analyses** **2021**	*Collect information on status-quo of soil quality (as defined in IP_S1, Step 1a) for the Alpine area is a first step that is directly followed by a hot-spot analysis of very productive soils and soils that have a high impact on mitigation. This data collection on the quality of Alpine soils shall be updated regularly to become a monitoring system on Alpine soils.*
Step 2: **Mapping soil functions in relation to potential uses (e.g. spatial planning) and ecosystem services** **2021-2022**	*Soil functioning maps shall be developed to communicate the importance of preserving productive and especially valuable soils. This step is guided by the aim of appropriate land use for each type of soil.*
Step 3: **Link and improve soil management strategies and agricultural practice** **2022-2025**	*Management recommendations specifically for the Alps intended to protect soils and enhance soil carbon and soil biodiversity shall be formulated. A special focus should be on wetlands, peatland, (riparian) forests, adaptation (e.g. water storage) and good agricultural practice in the sense of climate-resilience (e.g. tilling of grassland). To reach this goal, the linking and improving of soil management strategies and approaches is foreseen. Those recommendations shall include agricultural practices to build up humus/soil organic matter.*
Stakeholders needed for implementation	• *Working Group on Soil Protection of the Alpine Convention* • *Stakeholders of the Alpine Soil Partnership/Links4Soils* • *Agents for Soil protection on the international, national, regional and local level* • *Decision makers at international, national, local and regional level*

		• *Alpine Research Centres* • *JRC (Joint Research Centre) of the European Commission* • *Scientific community (e.g. University Innsbruck, Boku Vienna)* • *Alliances of farmers and land managers* • *Network of mountain pasture farmers* • *Managers of mountain forests* • *Stakeholder, who work in the field of hazard management* • *(Spatial planners)*
Indicators for monitoring this pathway		• *Alpine wide definition and data collection on soil quality and hot-spot analysis with soil function maps (y/n)* • *Management recommendations for valuable soil types (y/n)*
Link to other pathways		• *Direct link: IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo2: Promoting Alpine forests as carbon sinks* • *Indirect link: IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Define areas for monitoring of soil quality and starting the hot-spot analysis (together with Working Group Soil Protection).*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to give input for the data collection and hot-spot analysis.*
	Twinning/know-how transfer	• *Support cooperation between stakeholders – especially land manager and experts/manager on the local level.*
	Outreach	• *ACB shall spread the recommendations on management of soil types.*
	Knowledge hub	• *The knowledge hub of the ACB can be used for communicating the Alpine wide monitoring on soil quality.*
Integration in the ACB communication strategy	Contents	*Spread the outcome of the hot-spot analysis; communicate the direct link between the improvement of soil quality and agricultural practice*
	Tools	-

A8. Mountain Agriculture

8.1 IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture

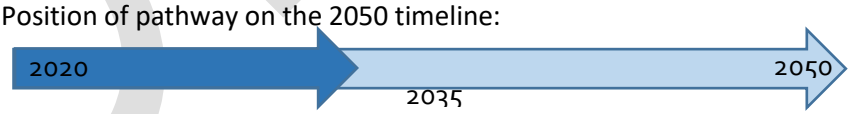
Basic information	
Background and description of the pathway	*Alpine agricultural products enter value-chains extending sometimes far beyond the Alpine region. On the one hand this provides a significant economic trigger to local products, on the other hand this could be responsible for emissions from transport for food-miles. At the same time, tourist diversification represent a major phenomenon to be observed across the Alps and visitors appreciate tasting local products on site, live a comprehensive tourist experience and bring back some of them to their places of origin. Alpine farming products show an inner high natural quality, tend to organise as niche productions, and need to see their full value (and costs) recognised in the consumer price. The resulting pathway has the objective to incorporate different trends and address both climate & socioeconomic dimensions in the agricultural sector in the Alps including support to regional agriculture, local consumption of mountain products, direct marketing (shortening of the value-chain), simplified access to mountains, promotional activities including a "climate message", climate and value-added indicators applied at the level of farms.*
Final output	• *Local consumption of Alpine agricultural products in Alpine regions* • *Increased share of climate friendly and locally produced animal feed and the number of rewetted agricultural wetlands* • *Promotion of local Alpine products as natural, tasty and climate-friendly* • *Increase in value-added & income from marketing of climate-friendly local products for Alpine farmers* • *Evaluation/report on CO_2-impacts of a higher use of Alpine products and local value chains*
Alpine specific character	*Alpine farming products have special characteristics of naturalness and high quality. Often they derive from Alpine species and are produced through traditional or locally adapted methods. Local production and consumption allow for a reduction of CO_2 emissions, and regional tourism in the Alps especially outside winter has seen an increase in local or regional green or climate-neutral offers and packages.*
Link to mitigation and/or adaptation	Mitigation: *x* — Adaptation: *x* *Actions to sustainable value-chains for products from Alpine agriculture shall take an integrated approach, considering both mitigation and adaptation needs.*
Implementation timeframe	Position of pathway on the 2050 timeline: 

	Start of first implementation step	*Now*
	End of last implementation step	*2025*
	Starting point already available?	*yes*
Link to target system	• *Direct link: T_Tr3: Reduced transport demand (passenger and freight); T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr2: Alpine value chains for agricultural products; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture ; T_MA1: Municipalities as transition engines; T_MA2: Climate action institutionalized in municipal action; T_MA3: Networks of CO_2-free municipalities; T_RD1: The Alps as model region for vulnerability assessments* • *Indirect links: T_Tr1: Modal shift of Alpine freight transit; T_Tou1: Car-free, attractive tourism traffic; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_S2: Enhanced Alpine soil quality*	
Sequence of implementation steps		
Starting point and links to stock-taking	*Green Economy Action Plan of the Alpine Convention (2019)* *RSA4 "Sustainable Tourism in the Alps – Report on the State of the Alps" (2013)* *Report of the WG Sustainable Tourism (2016)* *PSAC (2017). ALPINE SIGNALS 8 - Alpine Convention Mountain Agriculture Platform* *Local initiatives in Alpine countries (e.g. Project: Adopt an Alpine Organic Valley, Italy)* *Bergsteigerdörfer (stock taking No. 61), which have one focus on promotion and use of local and regional products* *Initiative "So schmecken die Berge" (taste of the mountains) of the German and Austrian Alpine Clubs (stock taking No. 64)*	
Step 1: Indicators for climate-friendly and sustainable Alpine farms **2021-2022**	*Identification of proper indicators for climate-friendly and sustainable farming to be applied at the farm level (organisation) or at the farming product level (good): indicators have to include mitigation and adaptation dimensions (e.g. use of renewable energy, GHG emissions, water use, use of chemicals, use of locally produced and climate friendly animal feed, rewetting of agricultural wetlands, etc.) as well as economic and social sustainability metrics (e.g. added value, serviced people, canteens, restaurants, shops, etc.). Indicators can be collected and harmonised from existing experience within and outside the Alpine region. The resulting system of indicators should deliver a complete information on the GHG impact of products from Alpine agriculture that can be used as a basis for private and public decision making.*	
Step 2: Set-up of an Alpine regional strategy for climate-friendly agricultural products	*The elements making up an Alpine regional strategy for the promotion of agricultural products can include:* 1. *Technical specific support and divulgation of better techniques and marketing strategies focalised for the Alpine farmers* 2. *Marketing initiatives for commercializing Alpine products locally in restaurants, hotels, shops, catering etc.*	

2021-2025	*3. Green public procurement applied by local administrations within the region (e.g. school and public offices canteens, etc.)* *4. Incentivisation of direct marketing/commercialisation of Alpine farming products from farmers aimed to shorten the value-chain and increase the share of added value retained by the producer* *Note that a proper consideration of the dimension of the "region" where the commercialization of Alpine farming products should be promoted is needed.*	
Step 3: **Set-up a "EU Day for the Alpine or mountain products" (EUDAMP)** **2021-2025**	*An "EU Day" dedicated to mountain/Alpine products with major events and supported by an EU-wide campaign should be determined and launched with a widespread support from Alpine countries and the Alpine Convention/PSAC.* *On this day, special voluntary public & private initiatives for promoting the consumption and knowledge of Alpine products and their attached benefits (including climate-friendliness, ecosystem services, biodiversity, cultural aspects, etc.) should be held in major cities in the Alps.* *Commercial initiatives by farmers, restaurants, agritourist facilities etc. could be concentrated in the period around the EU Day (e.g. Alpine cuisine menus in restaurants, tasting events, courses, a multi-media campaign etc.)*	
Stakeholders needed for implementation	*This pathway needs the involvement of the following stakeholder categories:* *Academics or Consultants in the field of sustainability indicators, EU Commission DG-Agriculture, DG-Climate, DG-Environment, Alpine Convention – ACB, PSAC and countries, National and regional administrations involved in farming & food policies, tourism development, environmental policies, Representatives/ stakeholders of tourism and mountain destinations or centres, Companies and entrepreneurs in fields linked to food value-chains, Farmers' associations* *NGOs involved in promoting sustainable tourism (CIPRA, ALPARC etc.)*	
Indicators for monitoring this pathway	*Step 1: Quantitative and qualitative and description of achieved results (indicator system and farmers joining the scheme)* *Step 2: Number of initiatives, destinations/towns, products involved and qualitative descriptions where needed* *Step 3: Qualitative description of the organisational aspects of the day; number of stakeholders agreeing to participate with own initiatives, description of outreach of the activities*	
Link to other pathways	• *Direct link: IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach* • *Indirect link: IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou2: Coaching and capacity building for climate proofing Alpine tourism; IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*ACB together with other thematic working bodies of the AC can support Step 1 with existing materials, promote activities throughout the Alps (Step 2) and lobbying for EUDAMP with EU and other institutions (Step 3).*

	Governance set-up	*ACB proposes to set-up a "steering group" within the MAMF WG to coordinate the steps. This steering group will be responsible for further steps of this pathway.* *National focal points can reach out to decision makers at national level to gain support for coordinated strategy and EUDAMP*
	Twinning/know-how transfer	*Use of the knowledge hub or climate portal of the AC.*
	Outreach	*Specific, ad hoc outreach activities of ACB aimed to inform about the coordinated Alpine strategy and the EUDAMP.*
	Knowledge hub	*Information on climate-reporting framework for agricultural products can be linked to knowledge hub.*
Integration in the ACB communication strategy	Content	*Information on metrics for climate-friendly Alpine farming, other statistics on the involved stakeholders and actions performed*
	Tools	*Include in the database, stocktaking report, etc. both the reporting framework (Step 1), and the draft regulations and initiatives needed for Step 2.*

8.2 IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming

<table>
<tr><td colspan="2">Basic information</td></tr>
<tr><td>Background and description of the pathway</td><td>Organic agriculture is known to exert less direct environmental impact on soils than traditional one. Moreover the use of heavy and energy-intensive methods that is often found in intensive farming and livestock farming is relatively scarce in Alpine regions also due to the limited attractiveness of the land for large productions. Against this background, farming in the Alps looks like suitable for adopting and testing organic and other low impact approaches to smaller food productions. This would require however a clear productive choice to be ideally supported by regional and national policy makers in order to achieve measurable targets.</td></tr>
<tr><td>Final output</td><td>Significant increase of the share of Alpine agriculture adopting climate-friendly and organic farming methods, resulting in the sub-outputs reported below:
Strong reduction in the use of chemicals in farming
Decrease in the use of energy and CO_2-intensive methods in mountain farming
Increase of organic farming up to 50% of the Alpine farming by 2050 (with respect to agricultural land)
Introduction of Alpine scheme(s) for CO_2-friendly or CO_2-neutral agriculture in the Alps</td></tr>
<tr><td>Alpine specific character</td><td>Mountain agriculture plays a central role in ensuring Alpine traditional landscape, regional breeds and species and preserving local culture, heritage and traditional techniques. The characteristics of Alpine food products & their market position call for higher quality that can have a considerable impact in reducing GHG emissions of agriculture.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td>Mitigation | x | Adaptation | x</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

<table>
<tr><td>Start of first implementation step</td><td>Now</td></tr>
<tr><td>End of last implementation step</td><td>2030</td></tr>
<tr><td>Starting point already available?</td><td>yes</td></tr>
</table></td></tr>
<tr><td>Link to target system</td><td>Direct link: T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr2: Alpine value chains for agricultural products; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_S1: Minimised land-take and sealing; T_S2: Enhanced Alpine soil quality; T_MA1: Municipalities as transition engines; T_MA2: Climate action institutionalized in</td></tr>
</table>

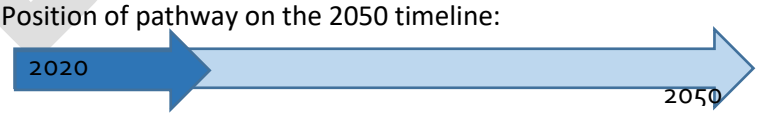
	municipal action; T_MA3: Networks of CO_2-free municipalities; T_RD1: The Alps as model region for vulnerability assessments; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers • *Indirect link: T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Fo4: Alpine-wide sustainable forest management; T_W1: Alpine-wide optimized water management; T_W2: Drinking water security*
Sequence of implementation steps	
Starting point and link to stock-taking	*Report "Adopt an Alpine bio/organic valley" (2019)* *Existing documentation of the mountain farming working group*
Step 1a: **Stocktaking on organic agriculture in the Alps** **2021-2022**	*Mapping of organic farming in the Alps including information on management techniques, use of pesticides and other chemicals etc. as well as their GHG reduction potential* *Identification of the organic farming "gap" against the target of 50% of Alpine agriculture shifted to organic methods by 2050*
Step 1b: **Organic agriculture scenarios for Alpine regions** **2021-2025**	*1. Development of a set of scenarios for organic/climate-friendly farming in the Alps.* *2. Gap analysis and business/strategic planning for filling in the gaps* *3. Identification of innovative management techniques being able to support the transition to a higher share of organic farming in the Alps at a reasonable cost (e.g. extensive agriculture, CO_2 storage of pastures and moorlands through grazing management plans, dual purpose breeds introduced, reduced use of fertilisers, low-taxation areas or production systems, incentivisation of small mechanization, etc.)* *4. Identification of possible solutions for the reduction of the costs of transition to organic farming*
Step 2: **Policies for achieving Alpine organic farming at 50% of total surface (or other indicator)** **2022-2025**	*Inventory of existing initiatives at different territorial levels supporting a transition from traditional to organic farming in the Alpine regions* *Identification of the multiple benefits of organic farming also through the approach of ecosystem services (ESS; including the social positive spillover effects e.g. in terms of contrasting out-migration, etc.)* *Identification of the "policy gap" (i.e. existing legal or institutional barriers to a shift to organic/climate friendly farming) for different territorial units* *First: Assessment of benefits and costs in alternative modes of farming (organic & traditional) in terms of e.g. yields and productivity, costs, demand for land, demand for crops and farming products and identification of situations where the transition can be sustainable (e.g. local level/alongside industrial production)*

	Elaboration of proposals of policy actions for increasing the share of organic farming in the Alpine regions up to 50% *Starting dialogue with relevant policy makers and stakeholders in the farming sector particularly Regions, associations, firms aimed at introducing incentives/removing barriers to a wider use of organic farming in the Alps* *The indicator/target could either refer to land use or to production (quantity or revenues or share of regional agricultural products, etc.)*	
Step 3: **Implementation of policy actions in different Alpine regions** **2025-2030**	*Introduction/Implementation or increase (depending on different countries) voluntary initiatives for organic farming (schemes) by firms and administrations (e.g. "organic/climate friendly" procurement by involved administrations and private entrepreneurs in the hospitality sector not necessarily limited to the stricter mountain regions; etc.)*	
Stakeholders needed for implementation	*Farmers' associations, consumers' groups (local and from larger towns), policy makers (regional, local including larger towns), consultancy firms or researchers/universities*	
Indicators for monitoring this pathway	*Step 1a: Number of maps and assessment of gap* *Step 1b: Number of scenarios and relative gaps* *Step 2: Current share or extension of land used for organic farming* *Step 3: Schemes developed and applied/tested*	
Link to other pathways	• *Direct link: IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture* • *Indirect link: IP_E1: Set-up a network of regional energy coordinators; IP_E2: Enabling an Alpine-wide energy democracy; IP_E3: Supporting low-carbon/low-energy Alpine lifestyle and business models; IP_E4: Supporting Alpine administrations as forerunners & models for the energy transition on their premises; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*ACB & MAMF can spread through their members/participants the achieved results across the Alpine countries* *ACB can support regional and national initiatives aimed at testing the methods and give them the*

		appropriate institutional visibility (link to communication)
	Governance set-up	*ACB/MAMF can participate in the elaboration of the different products foreseen within the pathway by providing expert and institutional advice*
	Twinning/know-how transfer	*Provision of data and technological infrastructure for the analyses foreseen*
	Outreach	*ACB and/or MAMF can raise visibility of the approach with national bodies, regional processes, expert audiences, EUSALP etc.*
	Knowledge hub	*Strong role in communicating data and schemes once prepared, also through the info hub.*
Integration in the ACB communication strategy	Content	*Information on all aspects in communication activities of ACB.*
	Tools	*Schemes and other outputs to be linked to ACB info hub.*

A9. Mountain Forests

9.1 IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests

<table>
<tr><th colspan="2">Basic information</th></tr>
<tr><td>Background and description of the pathway</td><td>Notwithstanding the widespread awareness of the protective function of mountain forests in the Alps and the existing national and regional initiatives supporting such a function in forest ecosystems, a scheme aimed at exploiting the full potential of Alpine protective forests applied extensively across the Alps does not exist. It could be an asset for recognising the critical mass of such an ecosystem service (ESS) on the whole Alpine region. The pathway aims at homogenising the experiences currently run across the Alps in a coordinated way aiming at developing an Alpine-wide scheme for the management and valorisation of protective functions of Alpine forests.</td></tr>
<tr><td>Final output</td><td>Definition of a Joint Alpine Scheme for monitoring the protective functions of Alpine forests under multiple dimensions, in support to the responsible institutions and stakeholders in forest management and planning.</td></tr>
<tr><td>Alpine specific character</td><td>Alpine regions are particularly exposed to natural hazards and protective forests can play a significant role in risk mitigation, as shown by several sources esp. by RSA7. The management of protective forests is already spread across the Alps and different countries adopt active policies in support of this ESS. Protective forests can play an important role in the region (both in the mountains and valleys) for safeguarding properties and local people’s life and well-being.</td></tr>
<tr><td>Link to mitigation and/or adaptation</td><td>Mitigation | | Adaptation | x
The pathway is primarily directed to adaptation (risk mitigation), however concomitant mitigation functions can also be performed by the same ecosystems targeted as providers of protective functions.</td></tr>
<tr><td>Implementation timeframe</td><td>Position of pathway on the 2050 timeline:
 

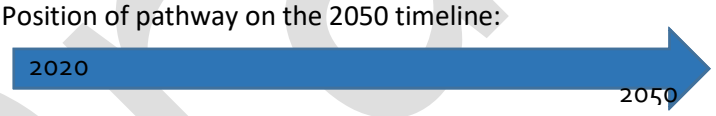
<table>
<tr><td>Start of first implementation step</td><td>Now</td></tr>
<tr><td>End of last implementation step</td><td>2025</td></tr>
<tr><td>Starting point already available?</td><td>yes</td></tr>
</table></td></tr>
<tr><td>Link to target system</td><td>• Direct link: T_SP2: Planning systems in risk management changed from passive to proactive; T_NH1: Alpine risk management; T_Eco3: Maintained and restored Alpine ecosystem services; T_Fo1: Potential of protective mountain forests fully used; T_Fo2: Mountain forests as carbon sink;</td></tr>
</table>

	T_Fo3: Accelerated forest conversion; T_Agr1: Energy self-sufficiency of Alpine farms; T_W3: Alpine-wide sustainable flood risk management; T_RD2: Open cross-cutting research questions answered • *Indirect link: T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_NH3: Individual risk precaution; T_Eco1: Preserved ecosystems and biodiversity; T_Eco4: Alpine ecological connectivity; T_Fo4: Alpine-wide sustainable forest management*
Sequence of implementation steps	
Starting point and links to stock-taking	• *RSA7 Report on the State of the Alps (2019)* • *Statement On the Value of Alpine Forests and the Alpine Convention's Protocol on Mountain Forests in the framework of the international forestry policies beyond 2015 (2014; Stock taking No. 13)* • *Report on Interactions between mountain forests and flood protection (Stock taking No. 32)* • *MANFRED - Management strategies to adapt Alpine Space forests to climate change risks (Project ASP; Stock Taking No. 70)* • *RocktheAlps – Harmonized ROCKfall natural risk and protection forest mapping in the ALPine Space (Project ASP; Stock Taking No. 73)* • *Several national and regional policies across the Alps*
Step 1: **Stocktaking of Alpine protective forests** **2021-2024**	*Common guidelines for all Alpine countries are to be delivered on a practice-oriented method for identifying and delimiting the areas and properties at risk in proximity to forest ecosystems, including an economic valuation of the service provided by them.* *Identification of existing protective forests and planned plantations/extensions of protective forests across the Alps*
Step 2: Identification of management techniques for protective forests **2021-2023**	*Survey of existing and new management techniques of protective forests, and their expected impact on the protective function with particular reference to co-benefits in the field of climate change (adaptation & mitigation)*
Step 3: **Alpine Scheme for protective forests** **2023-2025**	*Definition of a "Monitoring & Planning Scheme for Protective forests in the Alps"* *Formal adoption of the Scheme by the ACB/ Alpine Convention with the participation of selected stakeholders*
Stakeholders needed for implementation	*This pathway needs the involvement of the following stakeholder categories: National and regional forest services or competent Ministries, ´Alpine Convention – ACB, PSAC and countries, national and regional administrations involved in forest policies, civil protection, natural hazards, spatial planning, biodiversity experts representatives/stakeholders of forest management sector, forest*

	owners and their associations, NGOs involved in promoting sustainable forestry.	
Indicators for monitoring this pathway	*Step 1: Figures on valuation of exposed people and properties; figures on the share and absolute extension of protective forests (existing & planned)* *Step 2: Number of techniques/approaches/tools surveyed* *Step 3: Adoption (YES/NO) by Alpine Conference or Permanent Committee*	
Link to other pathways	• *Direct link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming; IP_NH3: Support measures to enhance individual risk precaution; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo2: Promoting Alpine forests as carbon sinks; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*ACB and PSAC support the actual implementation of the different steps requiring participation from wide Alpine territories (e.g. surveys, drafting & approval of the Scheme)*
	Governance set-up	*ACB & MAMF support and send experts in the expert group involved in implementing the pathway*
	Twinning/know-how transfer	*ACB and PSAC support knowledge transfer & promotion of the Scheme, incl. through infopoint networks*
	Outreach	*Specific outreach activities of ACB to inform about the definition and contents of the coordinated Alpine strategy.*
	Knowledge hub	*Information from the surveys and valuation exercises can be linked to, and spread through the knowledge hub.*
	Content	*Measures within the Scheme and all information can be communicated through ACB communication strategy,*

Integration in the ACB communication strategy		*channels and to stakeholders involved in its activities*
	Tools	-

9.2 IP_Fo2: Promoting Alpine forests as carbon sinks

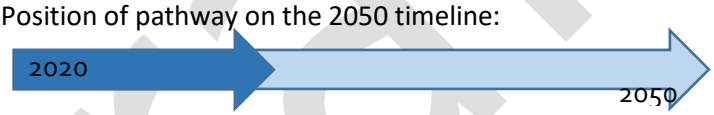
Basic information				
Background and description of the pathway	*The role of forests as C-sinks is well-known. However, it can be further supported by the use of appropriate and scientifically sound methods, often coupled with tools that allow a fine-tuning of the practices implemented. The pathway aims at providing Alpine forest managers with a set of calculation and management tools that allow a more effective use of Alpine forests as C-sinks.*			
Final output	• *Database of tools to account for CO_2 storage in Alpine forests* • *Prioritisation of interventions planned in forests based on the assessment of their fitness in storing CO_2* • *Criteria for use of different forest species aimed at maximizing C-storage*			
Alpine specific character	*The spread and growth of forests across the Alps qualifies the region as a potentially outstanding sink for CO_2 emissions in EU. However, there is no complete understanding and knowledge base on the potential of Alpine forest as C-sinks and on management practices that could increase their storing capacity.*			
Link to mitigation and/or adaptation	Mitigation	*x*	Adaptation	
Implementation timeframe	Position of pathway on the 2050 timeline: 			
	Start of first implementation step	*Now*		
	End of last implementation step	*2050*		
	Starting point already available?	*yes*		
Link to target system	• *Direct link: T_Eco3: Maintained and restored Alpine ecosystem services; T_Fo1: Potential of protective mountain forests fully used; T_Fo2: Mountain forests as carbon sink; T_Fo3: Accelerated forest conversion; T_RD1: The Alps as model region for vulnerability assessments; T_RD2: Open cross-cutting research questions answered* • *Indirect link: T_Eco1: Preserved ecosystems and biodiversity; T_Agr1: Energy self-sufficiency of Alpine farms*			
Sequence of implementation steps				
Starting point and link to stock-taking	• *Statement On the Value of Alpine Forests and the Alpine Convention's Protocol on Mountain Forests in the framework of the international forestry policies beyond 2015 (2014; Stock taking No. 13)* • *MANFRED - Management strategies to adapt Alpine Space forests to climate change risks (Project ASP; Stock Taking No. 70)* • *Several national and regional policies across the Alps*			

Step 1: Stocktaking & mapping of carbon sinks in the Alps **2021-2022**	*Identification of different types of forests and their age in the Alps* *GIS-mapping of identified types based on their ability to improve their C-storage capacity and performance*
Step 2: Analysis and collection of available CO_2 accounting tools for forests & consistent planning and management techniques **2021-2025**	*Collection of available CO_2 accounting tools for forests* *Collection of examples of management techniques including management of tree species and age in forest planning, based on their CO_2 storage capacity*
Step 3a: Set-up of targets and implementation procedure in line with EU Commission objectives of wood **2022-2025**	*Definition of specific targets for CO_2-friendly Alpine forest management and wood production in line with EU Directives (2020-2024) (e.g. forest types more suitable to store CO_2, priority interventions, use of accounting tools or other instruments, etc.)*
Step 3b: **Implementation of management tools in different Alpine regions until achievement of the targets** **2025-2050**	*Adoption of instruments for achieving the specific targets (defined under Step 3a) in the Alps until the achievement of the single targets and general goal of the pathway (2024-2050)*
Stakeholders needed for implementation	*Forest owners, forest professionals, forest services (national and regional), policy makers (national, regional, local), universities/ research institutions etc.*
Indicators for monitoring this pathway	*Step 1: Forest types maps* *Step 2: Number of tools and management techniques collected* *Step 3a: Qualitative description of the specific objectives/targets* *Step 3b: Number of forest managers in the Alps who use the tools as developed in step 3b*

Link to other pathways	• *Direct link: IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*ACB & MAMF take care of the liaison to the EC and other EU institutions, especially in aligning Alpine with EU objectives on forests, wood, biodiversity* *ACB can support regional and national initiatives aimed at the implementation of the agreed specific targets, and give them the appropriate institutional visibility (link to communication)*
	Governance set-up	*ACB/MAMF can facilitate stakeholder relationships, involvement and participation as well as the needed institutional agreements*
	Twinning/know-how transfer	*PSAC can host on its "climate portal" the outcomes of each step, the resulting datasets, and provide a geolocalization of the tests and their results on SOIA*
	Outreach	*ACB and/or MAMF can raise and promote the visibility of the approach across the whole Alps and ideally also in other mountain regions through international mountain cooperation initiatives (e.g. Carpathian Convention)*
	Knowledge hub	*Strong role of ACB/AC/PSAC website etc. in communicating techniques, achievements and metrics, also through the info hub.*

Integration in the ACB communication strategy	Content	*Information on all aspects in communication activities of ACB*
	Tools	*Schemes and other outputs to be linked to ACB info hub*

9.3 IP_Fo3: Accelerate forest conversion to more resilient and close-to-nature ecosystems

Basic information				
Background and description of the pathway	*The pathway aims at supporting a more rapid conversion of current forests to more resilient and close-to-nature forest ecosystems through a mix of management innovation and financial schemes. By 2050 a conversion of forest ecosystems to close-to-nature forests should have been achieved.*			
Final output	*Application of "Alpine guidelines" for conversion of forest ecosystems to more resilient forest*			
Alpine specific character	*The acceleration of forest conversion to more resilient ecosystems is an important issue in times of climate change – not only, but also for Alpine forests.*			
Link to mitigation and/or adaptation	Mitigation	*x*	Adaptation	*x*
	Notwithstanding the practice refers mainly to adaptation to climate change (CC), some elements can be useful also for developing forest functions in support to mitigation – as a co-benefit.			
Implementation timeframe	Position of pathway on the 2050 timeline:  			
	Start of first implementation step	*Now*		
	End of last implementation step	*2030*		
	Starting point already available?	*yes*		
Link to target system	• *Direct link: T_Eco1: Preserved ecosystems and biodiversity; T_Eco3: Maintained and restored Alpine ecosystem services; T_Fo1: Potential of protective mountain forests fully used; T_Fo2: Mountain forests as carbon sink; T_Fo3: Accelerated forest conversion; T_RD1: The Alps as model region for vulnerability assessments; T_RD2: Open cross-cutting research questions answered* • *Indirect link: T_Eco2: Alpine-wide system of protected areas; T_Fo4: Alpine-wide sustainable forest management; T_Agr1: Energy self-sufficiency of Alpine farms*			
Sequence of implementation steps				
Starting point and link to stock-taking	• *Statement On the Value of Alpine Forests and the Alpine Convention's Protocol on Mountain Forests in the framework of the international forestry policies beyond 2015 (2014; Stock taking No. 13)* • *MANFRED - Management strategies to adapt Alpine Space forests to climate change risks (Project ASP; Stock Taking No. 70)*			

	• *Several national and regional policies across the Alps*
Step 1: Study of forest development scenarios under climate change in the Alps **2021-2025**	*Promotion of studies (and/or their collection & harmonisation) aimed at identifying a few future development scenarios of Alpine forests and their types (species) and ages under CC*.
Step 2: Elaboration of Guidelines for Alpine forest conversion **2022-2028**	*Guidelines on forest planning aimed at increasing forest resilience to CC impacts including concrete examples and management techniques*
Step 3: Set-up of possible schemes for providing financial support to resilient forestry based on endemic species **2025-2030**	*Scheme(s) of payment for supporting the use of endemic species in forest management in the Alps defined and tested in some pilot-regions (payments from suitable sources: the payment should incentivise forest owners and managers to plant or continue to grow endemic species)*
Stakeholders needed for implementation	*Policy makers involved in forest management at regional and national level in particular, research community, forest owners, forest managers, managers of protected areas, EU institutions (DG Agri, DG Regio) for defining the payment schemes*
Indicators for monitoring this pathway	• *Step 1: Number of studies collected/harmonised* • *Step 2: Expert assessment of the elaborated guidelines* • *Step 3: Expected mobilized finance from the application of the financial scheme; actual implementation/test of financial schemes*
Link to other pathways	• *Direct link: IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Fo2: Promoting Alpine forests as carbon sinks; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*
Relevance of measure for the Alpine Convention	

Role of the Alpine Convention to implement the pathway	Implementation	*ACB & MAMF can participate in the collection of studies etc. based on the stocktaking they already performed (Step 1) and be involved in the elaboration of both the guidelines and the financial schemes. ACB can support regional and national initiatives aimed at the implementation of guidelines and financial schemes, and give them the appropriate institutional visibility (link to communication)*
	Governance set-up	*ACB/MAMF can manage the relationship with the other involved bodies or processes at different levels (e.g. EC, delegations, regions, EUSALP)*
	Twinning/know-how transfer	*PSAC can host on the climate portal the outcomes of each step and provide a geolocalization of the tests and their results on SOIA*
	Outreach	*ACB and/or MAMF can raise visibility of the results especially on the international level*
	Knowledge hub	*Strong role in communicating results also through info hub*
Integration in the ACB communication strategy	Content	*Information on all aspects in communication activities of ACB.*
	Tools	*Schemes, Guidelines, and other outputs to be linked to ACB info hub.*

9.4 IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach

<table>
<tr><td colspan="5">Basic information</td></tr>
<tr><td>Background and description of the pathway</td><td colspan="4">The pathway intends to promote a fully integrated approach to forest management in the Alps that can contribute to assure both a certain diversity of species and structures (height, age, ground cover, etc.) in Alpine forests and a good contribution to climate change mitigation in the region. In doing so, the pathway proposes a composite set of actions covering diverse interconnected domains (from C-storage to wood production and forest natural and recreational value)</td></tr>
<tr><td>Final output</td><td colspan="4">Application of the integrated approach to forest management in large shares of Alpine forests</td></tr>
<tr><td>Alpine specific character</td><td colspan="4">The pathway aims at exploring methods and solutions being suitable to mountain forests (particularly: Alpine forests) and tested in the Alps. Regional differences are possible concerning the most suitable approaches to be used.</td></tr>
<tr><td rowspan="2">Link to mitigation and/or adaptation</td><td>Mitigation</td><td>x</td><td>Adaptation</td><td>x</td></tr>
<tr><td colspan="4">The integrated approach covers both mitigation and adaptation.</td></tr>
<tr><td rowspan="4">Implementation timeframe</td><td colspan="4">Position of pathway on the 2050 timeline:
 
</td></tr>
<tr><td colspan="3">Start of first implementation step</td><td>Now</td></tr>
<tr><td colspan="3">End of last implementation step</td><td>2050</td></tr>
<tr><td colspan="3">Starting point already available?</td><td>yes</td></tr>
<tr><td>Link to target system</td><td colspan="4">Direct link: T_NH1: Alpine risk management; T_Eco1: Preserved ecosystems and biodiversity; T_Eco3: Maintained and restored Alpine ecosystem services; T_Fo1: Potential of protective mountain forests fully used; T_Fo2: Mountain forests as carbon sink; T_Fo3: Accelerated forest conversion; T_Fo4: Alpine-wide sustainable forest management; RD2: Open cross-cutting research questions answered
Indirect link: T_SP2: Planning systems in risk management changed from passive to proactive; T_E2: Renewable decarbonised Alps; T_E3: Decentralized, sustainable energy solutions for the Alps; T_Eco2: Alpine-wide system of protected areas; T_Eco4: Alpine ecological connectivity; T_Agr1: Energy self-sufficiency of Alpine farms; T_Agr2: Alpine value chains for agricultural products; T_W3: Alpine-wide sustainable flood risk management; T_S2: Enhanced Alpine soil quality</td></tr>
<tr><td colspan="5">Sequence of implementation steps</td></tr>
</table>

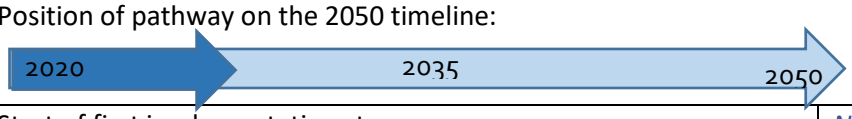
Starting point and link to stock-taking	*The pathway aims at setting up a complex management model for Alpine mountain forests that may support a regional transition to a sustainable forest management. This includes three main groups of actions that are supported by specific instruments/tools. Each of the Steps below refers to one of these three groups.* • *RSA7 Report on the State of the Alps (2019)* • *Statement On the Value of Alpine Forests and the Alpine Convention's Protocol on Mountain Forests in the framework of the international forestry policies beyond 2015 (2014; Stock taking No. 13)* • *Report on Interactions between mountain forests and flood protection (Stock taking No. 32)* • *MANFRED - Management strategies to adapt Alpine Space forests to climate change risks (Project ASP; Stock Taking No. 70)* • *RocktheAlps – Harmonized ROCKfall natural risk and protection forest mapping in the ALPine Space (Project ASP; Stock Taking No. 73)* • *Several national and regional policies across the Alps*
Step 1: Set integrated targets for sustainable Alpine forest management **2021-2025**	*The forest management targets of the Alpine-wide approach should encompass multiple forest functions, particularly climate change associated to other priorities (e.g. biodiversity, productive function, protective function, etc.)* *By means of a wide consultation with stakeholders (see below) and a survey in the domain of forestry and forest management, targets that are beneficial for more than one priority are selected*
Step 2: Achieving a better forest planning **2022-2030**	*A transition to a more efficient and effective forest planning aimed at achieving the specific objectives mentioned in Step 1 requires some operational tools that are set-up in this phase, i.e.:* 1. *Alpine associations (international and national, also more than one) of agronomy and forestry specialists focusing on Alpine specific issues with forest management;* 2. *An Observatory on forest genetics, health and yield for multiple purposes (CCS, protection, wood production, etc.)*
Step 3: Promoting regional and local use of wood from Alpine forests **2025-2050**	*Identification of market and non-market incentives and schemes for promoting the regional use of wood e.g. as construction material, in craftsmanship and industry, mainly in the same regions where forests are grown*
Stakeholders needed for implementation	*Policy makers involved in forest management at regional and national level in particular, research community, association of forestry companies and professionals, forest owners, forest managers, managers of protected areas, companies in the furniture, construction, design sectors*

Indicators for monitoring this pathway	*Step 1: Number of organisations or people involved in the consultation phase* *Step 2: Number of meetings of the Alpine associations or number of their members, Number of pilot-areas and/or surface in hectares that are formally included in the Observatory* *Step 3: Quantity of wood exported from the region where it has been grown, Number of companies operating in the forest-related sector, and data on sales/supply chains of wood industry in the region*	
Link to other pathways	• *Direct link: IP_Agr1: Promotion of Alpine Products and increase in locally retained value added for a sustainable and climate-friendly agriculture; IP_Fo2: Promoting Alpine forests as carbon sinks; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* • *Indirect link: IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	*AC can support the consultation with stakeholders (Step1), the creation of Alpine associations (Step 2), participate in providing data for the observatory (Step 2)* *ACB can help identify useful databases and experiences and involve national and regional actors, especially through its members.* *ACB will also corporate with MAMF for the same purposes.*
	Governance set-up	*ACB/MAMF can manage the relationship with the other involved bodies or processes at different levels (e.g. EC, delegations, regions, EUSALP)*
	Twinning/know-how transfer	*PSAC can host on the climate portal (or in a section on forests and CC) the outcomes of this pathway*
	Outreach	*ACB and/or MAMF can raise visibility of the results also by involving regional and local institutions as well as the EUSALP process*

	Knowledge hub	*Strong role in communicating results also through info hub.*
Integration in the ACB communication strategy	Content	*Information on all aspects in communication activities of ACB.*
	Tools	*Schemes and other outputs to be linked to ACB info hub.*

A10. Ecosystems and Biodiversity

10.1 IP_Eco1: Protection and management of vulnerable and Alpine specific landscapes and ecosystems

Basic information				
Background and description of the pathway	*Peatlands, raised bogs, wetlands, dry meadows, glaciers, rivers, high mountain regions, forests, traditional cultural landscapes as e.g. orchard meadows etc. – the Alpine area offers a wide range of specific natural and cultural landscapes with a great importance for (endangered) species of the flora and fauna. They are subject to different impacts, climate change, abandonment of agricultural use or intensification, urbanisation, infrastructure, which make them vulnerable and demands specific actions including restoration of specific natural and cultural elements, biotopes, ecosystems etc. At the same time Alpine specific landscape and ecosystems – like pasture areas – and their sustainable management ensure the maintenance, resilience and promotion of biodiversity and thus the provision and restoration of important ecosystems and services. The protection and wise management of vulnerable and Alpine specific landscape and ecosystems are crucial tasks.* *This implementation pathway is framed by existing regulations of the European Union as well as by the UNESCO Man and Biosphere programme and the Bern Convention. At the same time it takes into account the SDGs of the agenda 2030 (especially 2 – Zero Hunger and 15 – Life on Land), the AC Protocol on nature conservation and European Landscape Convention (ratified by Contracting Parties of the Alpine Convention (CH, FR, IT, SI).*			
Final output	• *Typology, collection of data and a comprehensive stock taking for vulnerable landscapes, Alpine specific landscapes and ecosystems as well as wilderness areas and distribution and occurrence of invasive alien species* • *Recommendations for planning, protection, restoration and management of vulnerable and Alpine specific landscapes, applying ecosystem based approaches* • *Recommendations/concepts for the handling of invasive species (neobiota)*			
Alpine specific character	*The Alpine landscapes are a global hotspot of biodiversity. Scientists estimate that more than 30,000 animal and 13,000 plant species are native to the Alps. The diversity of habitats and species is the result of the most varied, often very small-scale climatic and geological conditions, the different altitudinal levels as well as the different use as a basic for high quality food production. The outcome are various different landscape types with a high biodiversity level but also with a high range of sensitivity.*			
Link to mitigation and/or adaptation	Mitigation	x	Adaptation	x
Implementation timeframe	Position of pathway on the 2050 timeline:  			
	Start of first implementation step			*Now*
	End of last implementation step			*2027*
	Starting point already available?			*yes*

Link to target system	*Direct link: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes T_NH2: Permafrost and erosion monitoring T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco3: Maintained and restored Alpine ecosystem services; T_S1: Minimised land-take and sealing; T_S2: Enhanced Alpine soil quality; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_W1: Alpine-wide optimized water management* *Indirect link: T_E5: Climate proofed Alpine hydropower; T_NH1: Alpine risk management; T_Tou1: Car-free, attractive tourism traffic; T_Tou2: Sustainable diversification of Alpine tourism; T_Tou3: Minimized carbon footprint of Alpine hotels and gastronomy; T_Eco4: Alpine ecological connectivity; T_Fo1: Potential of protective mountain forests fully used; T_Fo2: Mountain forests as carbon sink; T_Fo4: Alpine-wide sustainable forest management; T_MA1: Municipalities as transition engines; T_RD1: The Alps as model region for vulnerability assessments; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers;*
Sequence of implementation steps	
Starting point and link to stock-taking	• *Work done by the Platform Ecological network of the AC (Econet)* • *Landscape typology implemented by the Contracting Parties* • *Landscape policies in Contracting Parties (adopted formally, in preparation or as a system of legally defined and connected steps/tasks in spatial planning, nature conservation, agriculture land management, rural development etc.)* • *Work done by the Alpine Biodiversity Board (ABB) of the Alpine Convention: Analysis of strategies, guidelines and political recommendations on biodiversity and landscape (new in preparation* • *Work of ALPARC (map of all protected areas >100ha for the Alpine area* • *Data of projects like Impuls4Action, AlpES, AlpBioNet and currently running projects such as Impuls4Action, LUIGI, ALPTREES, OpenSpaceAlps* • *Work of EUSALP AG7 concerning important habitats/ecosystems to be considered for green infrastructure implementation*
Step 1a: Typology, data collection and analysis on vulnerable landscapes in the Alpine area **2021-2022**	*As a first step (and built upon Work of EUSALP AG7 and projects mentioned as starting points), a typology, data collection and analysis on vulnerable ecosystems in the Alpine area (peatlands/raised bogs/wetlands/ /dry meadows/glaciers/rivers/high mountain regions/forests/traditional cultural landscapes as e.g. orchard meadows etc.) including upland-lowland interlinkages will be undertaken. This collection should be done in a cooperative way, including experts of all member states of the Alpine area and especially the Alpine Biodiversity Board. For instance the Natura2000 definitions of habitat types and species to be protected and promoted can serve as impulse for this typology, collection and analysis.*
Step 1b: Stock taking of Alpine specific landscape, ecosystems and ecosystem services **2021-2022**	*A stock taking of Alpine specific landscape, ecosystems and ecosystem services (more information provided within the project AlpES https://www.alpine-space.eu/projects/alpes/en/wikialps) will give an overview and is linked to the data collection of vulnerable landscapes (step 1a).* *Alpine specific landscape and ecosystem management, including the maintenance and restoration of pasture areas and the limitation of scrub encroachment, safeguards high-quality landscapes and ensures the maintenance and resilience of ecosystems and the provision of services.*

Step 1c: Overview and analysis of nature reserves and wilderness areas (IUCN categories Ia and Ib) and potential areas **2021-2022**	*Nature reserves and wilderness areas, areas with a specific size and clear rules for (non-)management, have a great importance and potential for nature conservation and process protection within the Alpine region. An overview (see as a starting point the results of Econet and AlpBioNet https://www.jecami.eu/viewer/saca/ and the analysis) of those existing areas in the Alpine states shall be input for an assessment of their role in preserving the vulnerable landscapes. The analysis of the potential new areas will be provided and should raise awareness towards the spatial dimension.*
Step 1d: Data collection of invasive alien species in the Alpine area **2021-2022**	*A list of invasive alien species in the Alpine area will be provided. This data will be compiled at national level and will be communicated and shared across borders. The distribution of neobiota species in the Alpine countries will be provided in a map. Also information about landscapes that are more exposed to invasive species could be included in this map.* *For this purpose, existing online maps should be used for the further development of the Alpine-wide overview of invasive species.*
Step 2: **Collection of management and preservation recommendations for Alpine specific landscapes** **2022-2023**	*The results of steps 1a, 1b, 1c and 1d are collected and analysed. They will be the basis of a collection of planning, management, restoration and preservation recommendations for Alpine specific landscapes.* *The recommendations aim to address the four mentioned topics:* • *The catalogue of landscape in the Alpine area is supplemented by (none-)planning, management (process protection) and preservation recommendations, also with a view to strengthen resilience of ecosystems.* • *The crucial benefits provided by Alpine ecosystems for an improved adaptive capacity to climate change are taken into account when describing recommendations for management, restoration and preservation. They will be integrated in plans about climate change at various scales.* • *The overview and analysis of nature reserves and wilderness areas (IUCN categories Ia and Ib) and potential areas leads to specific recommendation for the (non-)management of those areas.* • *The prevention of the new introduction of invasive alien species, early detection and an effective management and control of existing invasive alien species are the core parts of recommendations for the management of these species.*
Step 3: Monitoring of the implementation of existing regulations in the Alpine area **2023-2027**	*The implementation of EU Regulation II43 / 2014 on the prevention and management of the introduction and spread of invasive alien species as well as a rigorous and concrete implementation of the UNESCO Man and Biosphere Programme, the Bern Convention on the Conservation of European Wildlife and Natural Habitats, the EU Habitat and Birds Directive, strategies and reports under the CBD will be monitored for the Alpine area.*
Stakeholders needed for implementation	• *Biologists and landscape planners* • *NGOs dealing with nature protection, landscape planning and protection* • *Stakeholders with specific knowledge of Alpine landscape management*
Indicators for monitoring this pathway	• *Publication of data and information resulting from steps 1a-1d Specific common typology of Alpine landscapes are integrated in spatial planning instruments* • *List of recommendations for all topics mentioned in steps 1a-1d*

	• *Upgraded protection status of critical habitats* • *Monitoring system to screen the implementation of existing regulations has been installed*	
Link to other pathways	*Direct link: IP_SP1: Alpine wide concept „Spatial planning for climate protection"; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Eco2: Enhance transboundary cooperation on ecological connectivity of protected areas* *Indirect link: IP_NH2: Implementation of an Alpine wide monitoring of permafrost and geomorphological processes related to permafrost warming; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_W2: Tools and methods for drought management in the Alps; IP_W3: Implementing of an Alpine-wide flood risk management, based on nature-based solutions; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_Agr2: Moving to organic and climate-friendly methods in Alpine farming; IP_Fo1: Promoting the Full Use of the Potential of Alpine Protective Mountain Forests; IP_Fo2: Promoting Alpine forests as carbon sinks; IP_Fo3: Accelerate forest conversion to more resilient ecosystems; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach*	
Relevance of measure for the Alpine Convention		
Role of the Alpine Convention to implement the pathway	Implementation	• *Alpine Biodiversity Board (ABB) and the WISO could be involved in the steps 1a-1d and provide their information for these steps* • *Recommendation which are developed should be taken into account by the respective working bodies of the AC*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to provide information to gain a complete picture within the steps 1a-1d; further typologies and data should be further used be national and regional authorities* • *AC National Focal Points also call on national and regional authorities to get deeply involved in the recommendation-process*
	Twinning/know-how transfer	• *ABB uses its network to share results* • *AC networks and former groups dealing with Ecosystems and Biodiversity should be integrated in the discussion and working process from the very beginning*
	Outreach	• *ACB supports awareness raising and communication work* • *ACB and other working bodies of the AC spread the outcome*
	Knowledge hub	• *The Knowledge Hub of the ACB should be updated on a regular basis and can serve as a pool of information gained within this implementation pathway*

Integration in the ACB communication strategy	Content	*Share the knowledge about Protection and management of vulnerable and Alpine specific landscapes*
	Tools	*NGO networks; newsletters etc.*

10.2 IP_Eco2: Enhance transboundary cooperation on ecological connectivity

Basic information					
Background and description of the pathway	*Nature areas do not know any borders. But planning does. Enhancing transboundary cooperation on ecological connectivity of protected areas and other conservation areas within the Alpine perimeter is already an ongoing topic and a lot of work has been done to improve the cross border cooperation within the Alpine area until today. In the sense of climate change the need for a proper management of existing areas and the establishment of new areas to cover species, habitats and ecological processes that would no longer be included due to the shifts caused by climate change is even greater. The pathway draws possible steps to be done – also by integrating the spatial planning sector. This implementation path takes SDG 15 and 17 from the Agenda 2030 of all UN member states into account in particular.*				
Final output	• *Definition and stock taking of protected areas and other conservation areas in the Alps built upon existing work of e.g. ALPARC* • *Stakeholder network (protected areas and other conservation areas) and regular meetings* • *Connectivity between protected areas and beyond is maintained and further developed, in order to increase ecosystems resilience and to enable favourable conditions for Alpine species, habitats, ecological processes and process protection* • *Management plans that contain mitigation and adaptation aspects* • *Recommendations for Spatial planning instruments*				
Alpine specific character	*The Alpine territory should remain permeable and liveable for all species – therefore cross border cooperation for ecological connectivity within the Alpine arc and beyond is a main topic of the Alpine Convention.*				
Link to mitigation and/or adaptation	Mitigation	x	Adaptation	x	
Implementation timeframe	Position of pathway on the 2050 timeline: 2020 — 2035 — 2050				
	Start of first implementation step				*Now*
	End of last implementation step				*2050*
	Starting point already available?				*Yes*
Link to target system	*Direct link to: T_SP1: Priority for climate change mitigation and adaptation in spatial planning processes; T_Eco1: Preserved ecosystems and biodiversity; T_Eco2: Alpine-wide system of protected areas; T_Eco4: Alpine ecological connectivity; T_S1: Minimised land-take and sealing; T_RD1: The Alps as model region for vulnerability assessments* *Indirect links to: T_E3: Decentralized, sustainable energy solutions for the Alps; T_E5: Climate proofed Alpine hydropower; T_NH1: Alpine risk management; T_NH2: Permafrost and erosion monitoring; T_Tou2: Sustainable diversification of Alpine tourism; T_Eco3: Maintained and restored Alpine ecosystem services; T_Agr3: The Alps as model region for organic farming; T_Agr4: Resilient and climate-friendly mountain agriculture; T_W1: Alpine-wide optimized water management; T_W2:*				

	Drinking water security; T_W3: Alpine-wide sustainable flood risk management; T_S2: Enhanced Alpine soil quality; T_RD4: Research on climate-driven extreme events and climate impacts on glaciers
Sequence of implementation steps	
Starting point and links to stock-taking	• *Work done by the Platform Ecological network of the AC: e.g. Statement on the "Role of Ecological Connectivity for Adaptation to Climate Change Impacts in the Alps" (Stock taking No. 4[13]); stock taking report about spatial planning in the Alpine states* • *Alpine ecological connectivity for the next generations – Alpine Nature 2030 and AlpBioNet project by ALPARC (Stock taking No. 60)* • *GreenRisk4ALPs - Development of ecosystem-based risk governance concepts with respect to natural hazards and climate impacts - from ecosystem-based solutions to integrated risk assessment (Stock taking No. 83)* • *Current ALPARC projects (PLACE study; final version in summer 2020)*
Step 1: Definition and stock taking in the Alpine area (focus on transboundary areas) **2021-2022**	*A comprehensive stock taking of protected areas and other conservation areas as well as definitions of those areas are the first step on the way of enhancing transboundary cooperation on ecological connectivity of protected areas. For instance the following questions could guide this step: Which types of protected area and other conservation areas exist within the Alpine area? How much do they differ within the Alpine states? What does "protected" and "conservation" mean in the different areas? What about transboundary protected areas? What is the state of ecological connectivity?*
Step 2a: Establishment of a stakeholder network and regular meetings **2021-2050**	*Regular meetings of managers of protected areas should be enlarged by stakeholders for protected areas without an existing management in the Alpine regions. The meetings are already organized by important stakeholder of the Alpine area (ALPARC, former ECONET group of the Alpine Convention) and aim at facilitating the exchange and cooperation of managers and also provide a stage for presenting good practices and lessons learned in the context of transboundary cooperation.* *Those regular meetings should also draw their attention to adaptation and mitigation aspects of protected areas which should be mainstreamed in all management plans of existing and new protected areas in the Alps (see Step 2b).*
Step 2b: Mitigation and adaptation aspects in management plans (existing and new) **2022-2050**	*Existing protected areas should be further strengthened, including by establishing management plans that apply nature-based solutions, and new ones, for example UNESCO biosphere reserves, are designated to cover species, habitats and ecological processes that would no longer be included due to the shifts caused by climate change. For this, work done within Step 2a is a precondition.*
Step 3: Recommendations for Spatial planning instruments	*Spatial planning is a discipline which can better integrate the issue of connectivity in the planning processes. At this stage findings of the stock taking report about spatial planning in the Alpine states by Econet shall be taken into account (starting point). Spatial planners shall be integrated*

[13] References to Stock taking:
https://www.alpconv.org/fileadmin/user_upload/Organization/TWB/ACB/ACB_Stock-taking_report_2019.pdf

2023	*in a process of defining recommendations for spatial planning instruments at a very early stage.*	
Stakeholders needed for implementation	• *Managers of protected areas and stakeholder* • *Stakeholders of new potential protected areas (without and with management plans or management organisations) and other conservation areas* • *Spatial planners* • *Landscape planners* • *Stakeholders from different administrative levels (from municipality to state)*	
Indicators for monitoring this pathway	• *Stock taking report on protected areas in the Alpine area* • *At least two regular meetings of managers of protected areas and involved stakeholders of 'new' protected areas per year* • *Participation of spatial planners from every Alpine state at the regular meetings* • *Catalogue of recommendations for transboundary cooperation on ecological connectivity is available in every Alpine state (y/n)*	
Link to other pathways	*Direct link: IP_SP1: Alpine wide concept „Spatial planning for climate protection; IP_S1: Preservation and sequestration of carbon in soil with a focus on peatlands, moorlands and wetlands; IP_S2: Defining Alpine wide guidelines for minimised land-take and sealing; IP_Fo4: Promote an Alpine-wide integrated sustainable forest management approach; IP_Eco1: Protection and management of vulnerable and Alpine specific landscape* *Indirect link: IP_Tou1: Development of a coordinated vision for climate-neutral and climate-resilient Alpine tourism (incl. alignment of financing streams); IP_Tou3: Exploring the use of tourism packages for climate-neutral tourism; IP_NH1: Implementation of an Alpine-wide risk management plan, focusing on cross-border risks; IP_W1: Implementation of an Alpine-wide approach for mainstreaming climate change into transboundary water management; IP_SP2: Spatial planning measures for reducing the need of individual car traffic; IP_S3: Supporting measures to preserve and enhance Alpine soil quality; IP_Fo3: Accelerate forest conversion to more resilient ecosystems*	
Role of the Alpine Convention to implement the pathway	Implementation	• *Alpine Biodiversity Board (ABB) is involved in defining process and stock taking* • *ABB could support establishing the stakeholder network and organizing the first regular meetings together with ALPARC*
	Governance set-up	• *AC National Focal Points call on national and regional authorities to harmonize definitions and contribute to stock taking process* • *AC National Focal Points also call on national and regional authorities to get deeply involved in the spatial planning recommendations*
	Twinning/know-how transfer	• *ABB uses its broad network to share results – especially with connected disciplines like spatial planning)* • *AC networks and former groups dealing with Ecosystems and Biodiversity should be integrated*

		in the discussion and working process from the very beginning
	Outreach	• *ACB supports awareness raising and communication work* • *ACB and other working bodies of the AC spread the outcome*
	Knowledge hub	• *The Knowledge Hub of the ACB should be updated on a regular basis and can serve as a pool of information gained within this implementation pathway*
Integration in the ACB communication strategy	Content	*Share the knowledge about transboundary cooperation for ecological connectivity; communicate outcomes of meetings*
	Tools	*NGO networks; newsletters etc.*