



# Executive Summary

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## INTRODUCTION

### Project Overview

The SIEPPUR project aimed to develop and implement concrete measures to enhance the sustainability of snow management in Nordic snow sports. As climate change affects snow accessibility in Europe, it is crucial to adopt sustainable practices and build resilience in snow sports for the future of recreational and competitive Nordic skiing.

### Objectives and Methodology

The primary objective of the SIEPPUR project was to develop and implement effective, sustainable snow management strategies that would ensure the long-term viability of Nordic snow sports across Europe. This included an analysis of the current snow management, a gap analysis, identifying best practices for reducing resource use, creating a roadmap for a sustainable snow management future, improving governance within snow sport organizations, and generating new knowledge related to snow production, storage, transport, grooming, and handling and creating toolkits for venue managers and stakeholder.

## KEY ACHIEVEMENTS

### Current state of snow management

A central part of the project was the assessment of the current state of snow management, which involved ten biathlon venues across Alpine, Low Mountain, and Scandinavian regions. Field visits and extensive data collection revealed both diversity in technology used and commonalities in climate-related challenges across venues. The report shows that warming climates are reducing snow reliability, forcing Nordic snow sport venues to intensify snow management through snowmaking and storage practices that, while sometimes effective, demand significant resources and investment.

[D2.1\\_Current-state-of-snow-management\\_finish.pdf](#)

### Good Practices

Through literature reviews and expert interviews with industry leaders like Prinoth, Nordic Evolution, and TechnoAlpin, the project compiled 35 best practices across snow production, storage, grooming, transport, and handling, surpassing its original target. These practices were organised in a structured way to provide information about challenges, solutions and limitations of the known practice.

[D2.2\\_Guidelines-on-goodpractices\\_finish-1.pdf](#)

### Gap Analysis

Based on the information gathered in the report about the current state of snow management, a gap analysis was conducted to determine the best way to the desired snow state. The analysis showed that snow management at SIEPPUR venues is shaped by robust infrastructure and expert knowledge, though it is often hindered by limited documentation and gaps in quantitative data, especially regarding resource use. Operational constraints across venues come from climatic, hydrological, ecological, and socio-economic challenges which have an influence on the effectiveness and sustainability of snow management practices. As climate change intensifies, snow production and storage remain essential yet resource-intensive pillars.

[D2.3\\_Gap-Analysis\\_finish.pdf](#)



## Roadmaps and Governance Good Practices

The SIEPPUR project focused on transforming snow management practices by developing governance frameworks and technical strategies to support sustainability. A key achievement was the creation of four detailed roadmaps: an overarching Roadmap to Sustainable Snow Management and tailored roadmaps for Alpine, Mid-Mountain, and Scandinavian climate regions. These documents, informed by previous field research and stakeholder engagement, help guide venues in implementing best practices within their specific environmental contexts. Moreover, the project identified enabling governance practices essential for implementing these sustainable measures.



[Sieppur-Roadmap.pdf](#)

[D3.2\\_Sieppur-Roadmap-Alpine-005.pdf](#)

[D3.4\\_Sieppur-Roadmap-EUmidMountain.pdf](#)

[D3.3\\_Sieppur-Roadmap-Scandinavia.pdf](#)

[D3.5\\_Sieppur-Good-practice-case-studies.pdf](#)

## Gathering New Knowledge

In addition to strategic planning, SIEPPUR generated new scientific knowledge across multiple dimensions of snow management. Research into snow production used decades of local climate data to model production potential, helping venues plan based on actual cold-hour availability, water resources, and energy demands. In snow storage, innovative field experiments involving wind fences in Davos, while in Livigno they successfully demonstrated how to protect snow layers on green fields by mitigating heat exposure. Further advancements were made in snow handling, where dry snow sintering techniques showed that mixing coarse “dead” snow with fine-grained snow significantly enhances its structural integrity.

## Practical Training and Toolkits

The knowledge gathered was then translated from technical insights into practical training. A three-part webinar series, as well as local workshops in Sweden, Poland, and Slovenia, and four detailed toolkits helped venue operators adopt improved snow management technologies. These efforts significantly enhanced the sector’s capacity to apply climate-smart techniques.

## Dissemination

Dissemination and communication ensured that the project’s findings reached a broad audience. The initiative maintained an active communication presence through its dedicated website, LinkedIn, and biannual newsletters. The Mid-Term Conference and Sustainable Snow Summit (final Conference) gathered practitioners and stakeholders to exchange ideas and present innovations. These events, along with participation in over a dozen international conferences, amplified SIEPPUR’s impact across the winter sports and sustainability communities.

## CONTACT US

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