



DEVELOP CALL

Financial Support for Third Parties

Final Report Part A (Public)

*Avoine Map - Open-Source Spatial Tools
for Smart Rural-Urban Development*

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Executive Summary

Avoim Map was a nine-month PoliRuralPlus Develop Call project implemented from October 2025 to June 2026 in the Mallusjoki pilot region in Finland. The consortium - Avoim Map Oy, Feydec Oy and Saatsi Arkkitehdit Oy - completed the approved work plan and delivered three functioning, stakeholder-tested map services: Energy Map, Zoning Map and Activity Map.

The project addressed three practical rural-development needs. Energy Map makes building-energy information, costs, emissions and renovation options easier to examine. Zoning Map enables users to test how land-use and infrastructure scenarios affect soil and vegetation carbon stocks, sinks and emissions. Activity Map gives local events, attractions and services a shared, discoverable map-based view.

Development combined open geospatial data, Postgres/PostGIS-based services, open-source software, professional architectural input and local co-design. The Mallusjoki community hall provided a practical building-renovation case supported by laser scanning, drone imaging and initial condition plans. Local, municipal, regional and national stakeholders participated in workshops, interviews, testing and final review. Their feedback shaped data selection, usability, content governance, scenario functions and integration with existing services.

Project milestones and KPI thresholds were achieved. The three services reached operational pilot maturity, the final outputs and documentation were published through the AvoimOrg GitHub environment, and a technical contribution was submitted to JackDaw to demonstrate natural-language access to the project's building-energy data. The project also completed its communication package: two news articles, three PoliRuralPlus blog posts and launch, mid-point and final social-media materials.

The project leaves reusable open-source building blocks rather than a closed one-off pilot. Its principal legacy is a tested combination of modular technology, transparent data, accessible interfaces and stakeholder ownership. The services can be maintained and adapted for other Finnish and European rural regions while professional judgement, responsible data governance and continued local participation remain integral to their use.

1. Project Overview

Context and rationale

Mallusjoki is a rural village in the City of Orimattila, Päijät-Häme. Like many European rural areas, it combines strong community activity, cultural identity and environmental assets with practical challenges: information about events and attractions is fragmented, building-renovation decisions require complex data, and municipalities and planners need accessible ways to understand the environmental effects of land-use choices.

Extensive Finnish geospatial and administrative datasets exist, but they are distributed across separate sources and are difficult for non-specialists to use together. The project therefore focused on turning open data and calculation models into understandable, map-based services that support discussion, comparison and transparent decision-making.

Alignment with the Develop Call and pilot objectives

The project aligned with PoliRuralPlus objectives by strengthening rural-urban connections, supporting the Mallusjoki rural events ecosystem, enabling data-informed sustainable planning and contributing interoperable open-source components to the wider PoliRuralPlus tool ecosystem. The work also supported territorial identity and local participation by making rural places, activities and planning information easier to discover and discuss.

Target users and stakeholders

- Mallusjoki Youth Association, residents, event organisers, cultural actors and local SMEs;
- building owners, renovation professionals, architects and energy-service providers;
- the City of Orimattila, Päijät-Häme Regional Council, municipal and regional planners;
- national expert organisations, including the Finnish Environment Institute; and
- developers and European regions seeking reusable open-source geospatial components.

Solution and methodology

Avoim Map implemented three complementary services through an agile two-phase process: prototype and co-design, followed by final development, piloting, evaluation and dissemination. The methodology combined stakeholder workshops, usability interviews, technical sprints, open-data integration, professional building assessment, practical scenario testing and open-source documentation.

2. Progress Against Objectives and Work Plan

Completion of the two-phase work plan

Phase 1 (October 2025-January 2026) established the co-design group, technical requirements, data foundations, user-interface concepts and initial prototypes. Phase 2 (February-June 2026) completed programming, live pilot deployment, testing, evaluation, PoliRuralPlus integration work and the full communication package. Both phases were completed within the approved period.

KPI and deliverable completion matrix

Approved commitment	Final achievement	Status	Primary evidence
At least 15 stakeholders engaged; minimum 40% female participation	Threshold achieved through the documented co-design group, interviews, workshops, pilot testing and final review.	Achieved	Annex 1. GDPR compliant participant record
At least 3 use cases tested	Energy Map, Zoning Map and Activity Map were prototyped, tested and completed as the three pilot services.	Achieved	Live services, screenshots and Annex 1 including test records for 1. Building-upgrade, 2. Land-use planning, and 3. Rural Events Ecosystem.
At least 25 comments or ideas collected and integrated	Threshold achieved across local workshops, professional interviews, expert testing and technical reviews.	Achieved	Annex 1 including feedback-to-change records
Final digital web application with core features live	Three service interfaces were deployed and verified online, supported by shared open infrastructure.	Achieved	Service URLs and Part B access instructions
At least 25 rural events and 30 cultural-heritage sites listed	Content thresholds were reached in the Activity Map dataset.	Achieved	Activity Map content (facilitated user community submissions)
At least 15 users complete a building-upgrade or land-use scenario	Threshold achieved through Zoning Map pilot use and scenario testing.	Achieved	Zoning Map anonymous usage statistics recorded over 15 distinct users completing more than 100 analyses, scenarios or reports nationally between 1 March and 26 July 2026.
At least 3 municipalities or planning professionals report real-world use	Threshold achieved through municipal, regional and professional use connected with Mallusjoki and external expert testing.	Achieved	1. Building-upgrade use case: The Mallusjoki community hall served as a real building-renovation case. The Energy Map and architectural planning supported decisions concerning its transformation into a flexible Green Culture Centre with improved material and energy efficiency. 2. Land-use planning use case: Finnish Environment Institute experts used the Zoning Map to assess how a hypothetical solar-energy site and connecting power line would affect local carbon stocks. Their testing informed decisions on usability, calculation logic, scenario recalculation and the reliability of updated results. 3. Rural Events Ecosystem use case: The Mallusjoki Youth Association, the City of Orimattila and the Päijät-Häme Regional Council used and reviewed the Activity Map in the context of improving the visibility and coordination of rural events, cultural-heritage sites and year-round activities. Their input informed decisions on content structure, filters, map-list consistency and event-submission functions. Together, these final use cases supported concrete development and planning decisions concerning building renovation, climate-conscious land-use assessment and interoperable rural event communication.
Open-source outputs, documentation and PoliRuralPlus connection	Code and documentation were made available through AvoinOrg; a JackDaw pull request and Code Camp demonstration validated interoperability.	Achieved	GitHub repositories, JackDaw contribution and Code Camp deck
2 news articles, 3 blog posts and staged social-media outputs	The complete required communication package was produced and published with EU visibility.	Achieved	Publication links

Milestones and deviations

Technical, stakeholder, communication and reporting milestones were completed. There were no formal deviations from the approved objectives, budget, timetable or expected outputs. Normal implementation refinements, including the final

division of functions between the three services and the prioritisation of stakeholder-requested features, were handled within the approved modular work plan.

3. Technical Results and Outputs

Final solution architecture

The final solution uses modular web applications connected to open geospatial infrastructure. Browser-facing services are deployed through web hosting environments including Netlify and the activity.avoin.org domain. Backend components, authentication and map-data services use Docker-based infrastructure hosted on EU-located Hetzner virtual private cloud instances. Postgres/PostGIS provides structured spatial storage, while GeoServer and open APIs support map services and interoperable data exchange.

The codebase supports Finnish and English interfaces and is organised through public AvoinOrg repositories. Relevant outputs use open formats and standards, including GeoJSON and WMS/WFS-compatible geospatial services. Code is intended for permissive open-source reuse, with data and documentation made available under open licensing where source-data terms allow.

Energy Map

Energy Map provides a building-centred interface for exploring energy classes, heating and ventilation methods, estimated consumption, costs, emissions and renovation effects. Users can edit building details and compare alternatives in a spatial context. The service was grounded in a real Mallusjoki case: Saatsi Arkkitehdit carried out laser scanning, drone imaging, a building survey and initial condition planning for the Mallusjoki community hall together with the Mallusjoki Youth Association.

Final maturity: functioning online pilot service with documented backend data architecture, interface implementation and reusable building-energy data service.

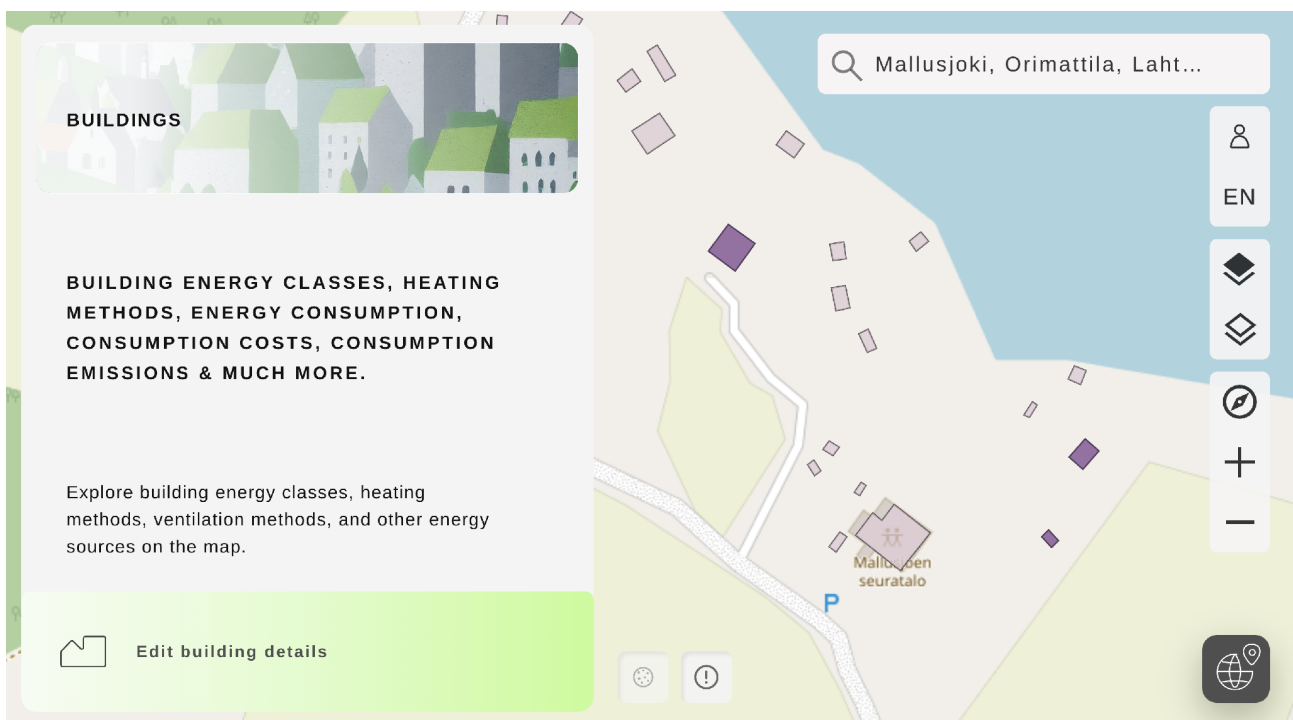


Figure 1. Energy Map centred on the Mallusjoki pilot area.

Zoning Map

Zoning Map supports climate-conscious land-use and infrastructure planning. Users can draw or upload planning areas and line infrastructure, adjust land-use assumptions, compare scenarios and assess effects on soil and vegetation carbon stocks, sinks and emissions. The final service includes alternative basemaps, transparency controls, updated calculation logic and export of geospatial results.

The service was tested with local and national stakeholders, including the Finnish Environment Institute. It is a decision-support tool: carbon effects are made visible, while biodiversity, water systems, landscape, livelihoods, cultural values, legislation and participation remain part of professional planning.



Figure 2. Zoning Map showing a hypothetical solar-energy area and power-line scenario in Mallusjoki.

Activity Map

Activity Map combines a map, category-based browsing, event information, and moderated content submission. It creates a shared entry point for local events, attractions, cultural destinations, nature-based activities and services. The service was designed to complement existing municipal and regional calendars rather than duplicate them.

The final dataset met the project targets for events and cultural-heritage destinations. The service model also addresses long-term governance: local information can be submitted easily, while moderation supports accuracy and trust.

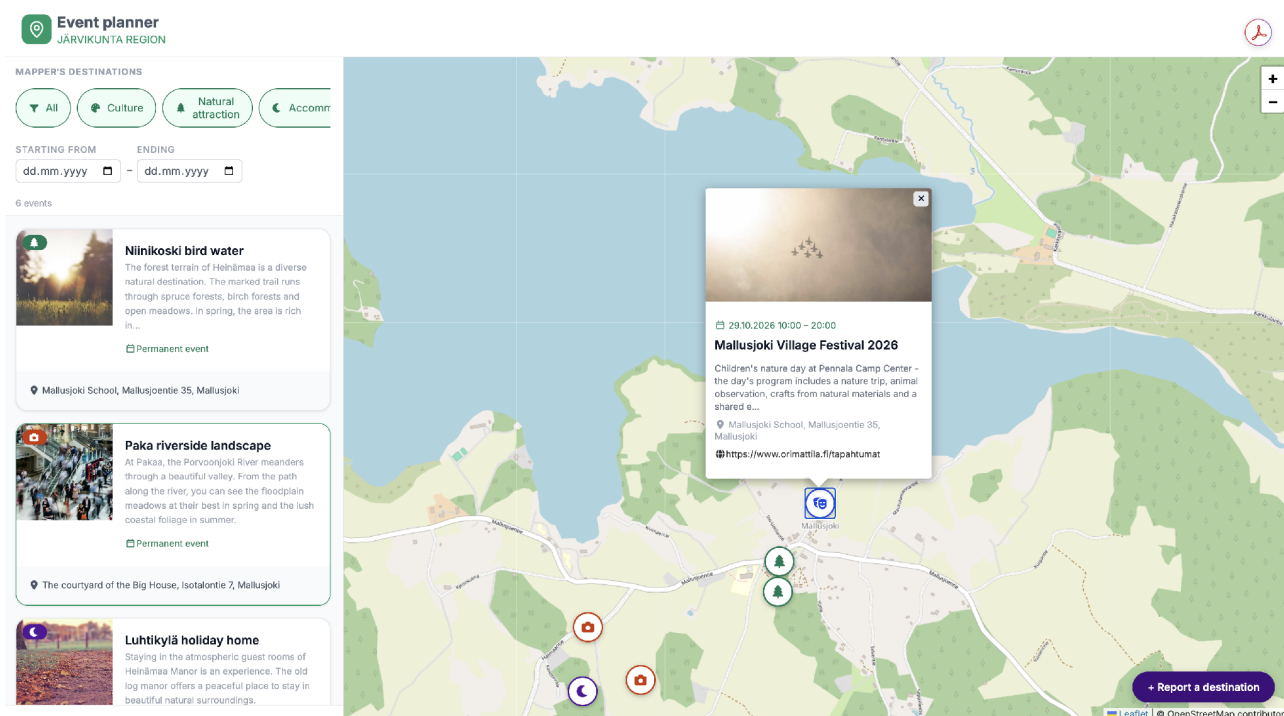


Figure 3. Activity Map demonstrating events and destinations in a shared map view.

Access, documentation and maintenance

Energy Map: <https://energiakartta-test.netlify.app/en>

Zoning Map: <https://hiilikartta-test.netlify.app/>

Activity Map: <https://activity.avoin.org>

Open-source organisation: <https://github.com/AvoinOrg>

Restricted test credentials and detailed verification steps are provided in Part B. The consortium retains the ability to maintain the shared infrastructure and service code. Open repositories, technical specifications, methodology descriptions, and service-level documentation reduce dependence on individual developers and support future replication.

4. Integration and Contribution to PoliRuralPlus

Contribution to the PoliRuralPlus ecosystem

The project used the PoliRuralPlus context to connect a local Finnish pilot with a wider European ecosystem of rural regions, researchers and digital tools. Advisor and other PoliRuralPlus materials supported early concept work, while the project's modular data structures were designed for compatibility with tools such as JackDaw, MapWhiteboard, GeoSurvey and WikiLocal.

JackDaw integration

The most concrete interoperability result was a pull request submitted to JackDaw. It enables the tool to access and interpret the building-energy dataset developed through Avoin Map. In the demonstration, a user selects the Mallusjoki area and asks what building information is available; JackDaw explains the data, relevant limitations, and possible follow-up questions.

The contribution was presented at the PoliRuralPlus Code Camp on 17 June 2026. It demonstrates the value of structured open data and conversational access: users do not need to discover and interpret every source independently before they can begin exploring an area.

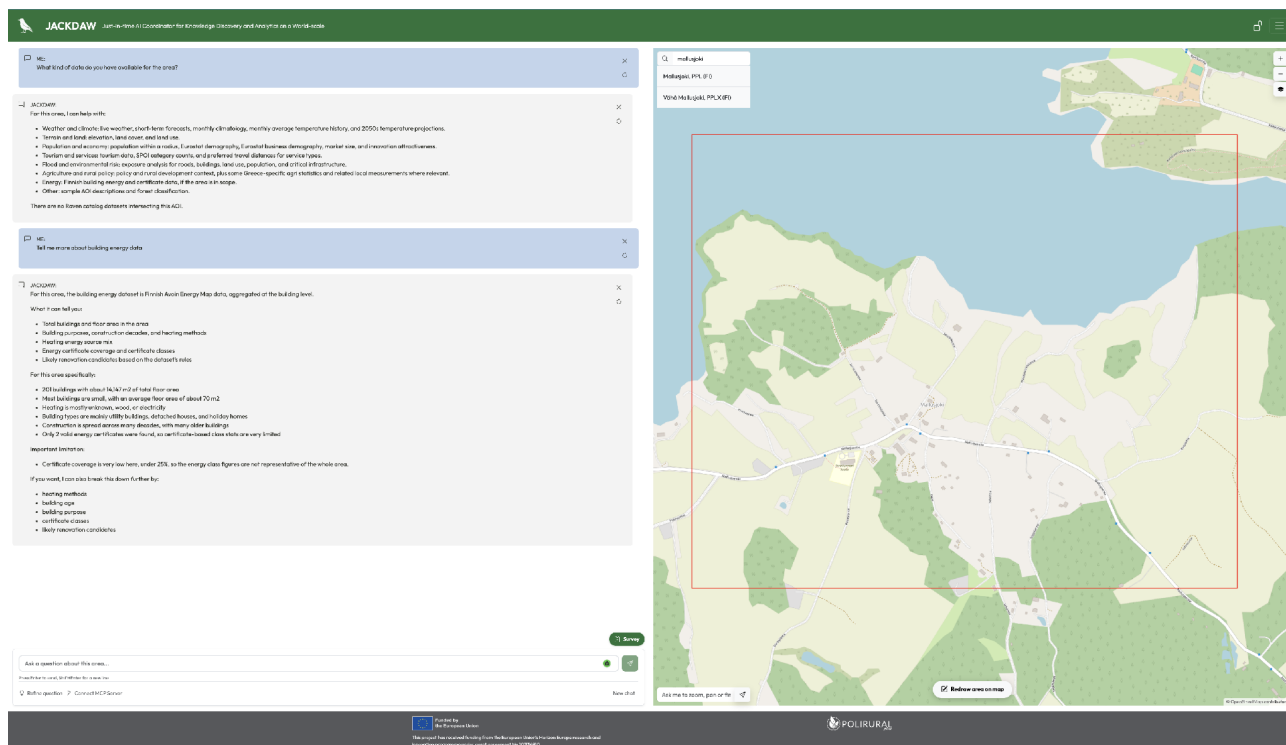


Figure 4. Demonstration of Mallusjoki building-energy data in JackDaw following the submitted pull request.

Reusability and synergies

The project's principal repositories include avoin-map, avoin-server-infra, geoserver-infra, hiilikartta-data-service and avoin-energy-map-service. Together they provide reusable front-end, infrastructure, geospatial and data-service components. The use of PostGIS, Docker, open APIs and exportable geospatial formats makes it possible to connect the services with other planning, participation and analytics environments.

The services also complement existing Finnish initiatives: the Activity Map can connect with municipal and regional event ecosystems, Zoning Map builds on earlier development and nationally relevant climate-planning methods, and Energy Map extends earlier open building-energy modelling into a rural renovation context.

5. Stakeholder Engagement and User Involvement

Stakeholder groups and methods

Stakeholder engagement began at project start and was concentrated before and during interface design so that the services would respond to real needs rather than receive feedback only after implementation. Engagement continued throughout programming and concluded with a final online review.

- local scoping and co-design with the Mallusjoki Youth Association and community actors;
- online and in-person workshops with the City of Orimattila and Päijät-Häme Regional Council;
- building-related interviews, site work and professional review led by Saatsi Arkkitehdit;
- technical and usability testing with the Finnish Environment Institute and planning professionals;
- prototype demonstrations, scenario testing and iterative developer reviews; and

- a final online review meeting with the Mallusjoki Youth Association, City of Orimattila and Päijät-Häme Regional Council.

How feedback changed the services

Need or feedback	Implementation response	Result
Local information was scattered, and existing calendars should not be duplicated.	Activity Map combined a shared spatial view with links, categories, simple submissions and moderated content.	A locally manageable discovery service that complements municipal and regional channels.
Building information needed to support practical renovation discussion, not only technical data viewing.	Energy Map combined consumption, cost and emissions perspectives; community-hall survey work provided a real case.	More useful dialogue between owners, architects, planners and energy-service providers.
Renewable-energy and infrastructure planning needed transparent carbon-impact comparison.	Zoning Map added line infrastructure, editable assumptions, scenario comparison, updated sink/emissions logic and geospatial export.	A science-based tool for examining alternatives before decisions are finalised.
Complex GIS functions had to remain usable for non-specialists.	Interfaces were simplified, visual hierarchy refined and bilingual guidance incorporated.	Lower threshold for rural organisations and public-sector users.
Project data should connect with wider European tools.	Open services and repositories were documented, and a JackDaw pull request was implemented.	Validated interoperability and stronger reuse potential.

Evidence of participation and uptake

The project met its participation, feedback and user-testing thresholds. Detailed attendance information, GDPR consents, meeting minutes and the final-review screenshot are held in the confidential evidence package referenced in Part B. Public reporting identifies organisations and roles rather than unnecessary personal data.

6. GDPR Compliance and Participant Data Protection

The project processed a limited amount of personal data in connection with stakeholder engagement, workshops, interviews, testing activities and final validation. The information collected was restricted to what was necessary for documenting participation, monitoring project indicators, recording stakeholder feedback and meeting contractual, reporting and audit requirements. Depending on the activity, this included participants' names, organisations, professional roles, attendance information, consent choices and, where applicable, photographs or meeting screenshots.

Personal data were handled in accordance with the principles of the EU General Data Protection Regulation (GDPR), including lawfulness, transparency, purpose limitation, data minimisation, accuracy, storage limitation and confidentiality. Consent or another applicable lawful basis was used according to the nature of the interaction.

This public report presents stakeholder participation principally through organisations, roles and aggregate figures. Participant contact details, attendance signatures, individual consent records and other identifiable evidence are not included in the public reporting package.

The underlying participation and consent records are archived internally in an access-controlled project archive and kept separate from publicly available project outputs. Access is restricted to authorised consortium personnel and, where necessary, persons responsible for contractual verification, reporting or audit. The records will be retained only for as long as required by the project agreement, applicable legal obligations and legitimate reporting or audit needs, after which they will be securely deleted or anonymised.

Photographs and other identifiable material used in public communications were selected on the basis of appropriate consent or were otherwise non-identifiable. Public communication materials also include the required EU funding acknowledgement and PoliRuralPlus visibility elements.

7. Communication, Dissemination and Visibility

The communication package was delivered. Published materials acknowledged PoliRuralPlus and Horizon Europe funding and used GDPR-compliant photographs, service screenshots, illustrations or infographics as appropriate.

Output	Title or purpose	Publication / evidence
Blog post 1	Digital services for the Rural Events and Activities ecosystem are under development for the Mallusjoki pilot region	PoliRuralPlus platform, 16 March 2026
Blog post 2	Map services for rural sustainability: from energy renovation to climate-conscious land use	PoliRuralPlus platform, 24 July 2026
Blog post 3	Activity Map for rural events: making local life easier to discover	PoliRuralPlus platform, 24 July 2026
News article 1	Avoine Map project reaches mid-term milestone in Mallusjoki	PoliRuralPlus news, 16 March 2026
News article 2	Avoine Map project completes three pilot services for sustainable rural development	PoliRuralPlus news, 24 July 2026
Social media	Launch, mid-point and final LinkedIn summaries, including a four-page service carousel	Avoine Map LinkedIn and Facebook channels, 15 November 2025, 15 March 2026, 26 July 2026
Event / demonstration	Avoine Map - PoliRuralPlus Code Camp	Demonstration and presentation deck, 17 June 2026

Public links

Blog 1:

<https://www.poliruralplus.eu/knowledge-transfer/blog/rural-industry-ecosystem-services-are-under-development-for-the-mallusjoki-pilot-region/>

Blog 2:

<https://www.poliruralplus.eu/knowledge-transfer/blog/map-services-for-rural-sustainability-from-energy-renovation-to-climate-conscious-land-use/>

Blog 3: <https://www.poliruralplus.eu/knowledge-transfer/blog/activity-map-for-rural-events-making-local-life-easier-to-discover/>

News 1: <https://www.poliruralplus.eu/news/avoin-map-project-reaches-mid-term-milestone-in-mallusjoki/>

News 2: <https://www.poliruralplus.eu/news/avoin-map-project-completes-three-pilot-services-for-sustainable-rural-development/>

LinkedIn 1:

https://www.linkedin.com/posts/buttonprogram-org_go-mallusjoki-ideathon-brought-people-together-activity-7395526853521735681-OLjj?utm_source=share&utm_medium=member_desktop&rcm=ACoAAAtfWsbJbaQTc-hzpKOTe_KRT72v-647Xs

Facebook 1:

https://www.facebook.com/Avoine.org/posts/pfbid0zvP1YJJs9oaeBsYAvvHMs1ZEBF4aDP7MbbK66MKkMwG8BfTe3LbpzbNqc1anYixDI?locale=fi_FI

LinkedIn 2: <https://www.linkedin.com/feed/update/urn:li:activity:7438847457805107200>

Facebook 2:

<https://www.facebook.com/AvoineMap/posts/pfbid02KPx6VM3hzgowUDLqNJ8UrWhowgNwrSjHhepyGRKbKV7kpM4gR4FHSnJ5Pq6U2Cp6l>

LinkedIn 3: <https://www.linkedin.com/feed/update/urn:li:activity:7487137574113886208>

Facebook 3:

<https://www.facebook.com/AvoineMap/posts/pfbid0nV1nBfFMzQbUMNwzyxzHAppgt1Cd6AcAo6FfXj8HK8RVuvzcPBLpdZiTts1gpZ61l>

8. Impact Assessment

Achieved impacts

Impact dimension	Achieved result	Evidence / indicator
Technical	Three functioning map services, shared geospatial infrastructure, open repositories and a JackDaw contribution.	Live deployments, repositories, Code Camp presentation and screenshots.
Social and cultural	Improved visibility of rural events and destinations, stronger local ownership and a clearer digital expression of place.	Activity Map content, stakeholder validation and final review.
Environmental	Accessible comparison of building-energy measures and land-use carbon effects supports lower-impact choices.	Energy and zoning scenarios completed by pilot users.
Economic	Better information supports renovation planning, service-provider dialogue, event promotion and visitor discovery.	Community-hall case and rural event ecosystem use case.
Policy and planning	Municipal, regional, and expert users gained transparent tools for discussing climate and rural development options.	Use and review by public-sector and planning stakeholders.
European added value	Local results were connected with open European collaboration and a wider digital ecosystem.	PoliRuralPlus publications, Code Camp and JackDaw interoperability.

Contribution to Mallusjoki

The pilot now has practical digital foundations for three interconnected priorities: a more visible and coordinated rural events ecosystem, better-informed development of the community hall and other buildings, and more transparent climate-conscious land-use discussion. The project also strengthened cooperation between local, municipal, regional, professional and national actors.

New European Bauhaus reflection

Sustainability was addressed through energy-efficiency and land-use carbon tools, open-source reuse and lower-impact planning. Inclusion was addressed through early co-design, balanced participation, bilingual guidance, accessible interfaces and moderated community contributions. Aesthetics were treated as functional: visual clarity, map composition, service identity and attractive presentation were used to make complex information approachable and rural places more visible. The community-hall work linked these principles to a tangible cultural-heritage setting.

9. Challenges, Risks and Lessons Learned

Challenges and mitigation

Challenge	Mitigation	Outcome / lesson
Heterogeneous data sources and incomplete records	Modular data services, transparent assumptions, source documentation and clear limitation messages.	Services remain useful without presenting estimates as complete or certain facts.
Complex models versus non-specialist usability	Iterative interface testing, simplified workflows, visual summaries and staged detail.	Usability must be designed together with calculation logic, not added after development.
Several service tracks within a short project period	Shared infrastructure, clear partner roles, sprint reviews and early stakeholder onboarding.	Modularity reduced dependency risk and allowed parallel progress.

Challenge	Mitigation	Outcome / lesson
Integration with an evolving external ecosystem	Open formats, repository-based collaboration, direct technical dialogue and a concrete JackDaw pull request.	A small verified integration is more valuable than an abstract compatibility claim.
Long-term accuracy of community content	Easy submissions combined with moderation and links to existing information channels.	A rural event service requires both an organisational governance model and software.

Recommendations for future projects

- secure local content ownership and maintenance responsibilities at the beginning of scaling;
- retain transparent source, method and uncertainty information in every decision-support result;
- test with real cases and professional users before expanding feature scope;
- use common open infrastructure where possible, but allow regional interfaces and content models to differ;
- treat interoperability as a tested workflow with a named consumer, not only as a technical standard; and
- keep stakeholder evidence and feedback-to-change records continuously rather than reconstructing them at reporting stage.

10. Sustainability, Replicability and Next Steps

Technical and organisational sustainability

Avoim Map Oy and Feydec Oy can maintain the service interfaces, repositories and shared cloud infrastructure, while Saatsi Arkkitehdit can continue supporting building-renovation and planning use cases. Public repositories, containerised deployment, documented data services and modular components make maintenance transferable and reduce lock-in.

For Activity Map, sustainable operation also depends on local governance. The scalable model therefore combines community submissions, moderation and links to existing municipal and regional channels. For Energy Map and Zoning Map, continued professional use requires regular review of source datasets, coefficients, calculation logic and legal/planning context.

Replication and scaling

The services can be replicated separately or as a combined toolkit. A region can reuse the common map and infrastructure components, connect its own datasets, translate the interface and adapt categories or calculation assumptions. This is especially relevant to rural regions that need capable tools but cannot procure and maintain large proprietary GIS platforms.

Next steps and exploitation

- maintain the final pilot services and repositories after the funded period;
- seek municipal, regional and project-based partnerships;
- develop further integrations with PoliRuralPlus and other open geospatial tools;
- extend Activity Map content partnerships and local moderation arrangements;
- continue improving Energy Map and Zoning Map methods as new datasets and policy requirements become available; and
- reuse the service architecture and lessons in other Finnish and European rural-development initiatives.

11. Conclusions

Avoin Map completed the Develop Call project in full and delivered the intended technical, stakeholder, communication and reporting results. Three operational pilot services demonstrate how open geospatial data can support building renovation, climate-conscious land-use planning and rural event visibility in a form that is understandable and reusable.

The project's strongest achievement is the combination of local relevance and open technical foundations. Mallusjoki supplied real needs, cases and organisations; the consortium contributed geospatial design, software engineering and architectural expertise; and PoliRuralPlus connected the work to a broader European vision and tool ecosystem.

The results have strategic value beyond the pilot. They show that small rural regions can gain access to sophisticated planning and visibility tools when open data, careful interface design, professional expertise and stakeholder participation are developed together. The completed services, documentation and JackDaw contribution provide a credible basis for maintenance, replication and future collaboration.

Optional Annexes

The following supporting materials are available in the project reporting package:

- A1. GDPR compliant participant record;
- A2. Avoin Map - PoliRuralPlus JackDaw Code Camp presentation, 17 June 2026;
- A3. Visual template for rural event posters;
- Technical specifications of the Energy Map database (was included in the Mid-Term Report);
- Methodological summary and report example for Zoning Map (was included in the Mid-Term Report);
- Mallusjoki Community Hall condition plans and survey material (was included in the Mid-Term Report);