Swedish Metals & Minerals

impact innovation

From Waste to Resource: Waste Foundry Sand in Unbound Road Materials

- Project: P2025-03570
- Coordinator: VTI, Swedish National Road and Transport Research Institute
- Presenter: Dina Kuttah, Senior researcher

Swedish Metals & Minerals
impact innovation

Project information

Project period

December 2025 – December 2027

Consortium Partners (16 partners with VTI)

- Industry: 10 Swedish foundries (e.g., Scania, SKF, Åkers Sweden, etc.)
- Material supplier: Sibelco
- Industry organization: Svenska Gjuteriföreningen (Swedish Foundry Association)
- End users: Skogsstyrelsen (Swedish Forest Agency), Trafikverket (Swedish Transport Administrationn) and Skanska

Project Budget

- Total budget: ~4.7 million SEK
- Funding agency: ~3.27 million SEK from the Swedish Energy Agency (Energimyndigheten)
- Funding level from the Swedish Energy Agency : 70%
- Partner contribution: In-kind (materials, analysis, expertise, participation) 30%

Programme

- Impact Innovation Programme-Swedish Metals & Minerals
- Focus areas: Secondary raw materials and reduced environmental impact from waste streams

Swedish Metals & Minerals
impact innovation

Project Objective

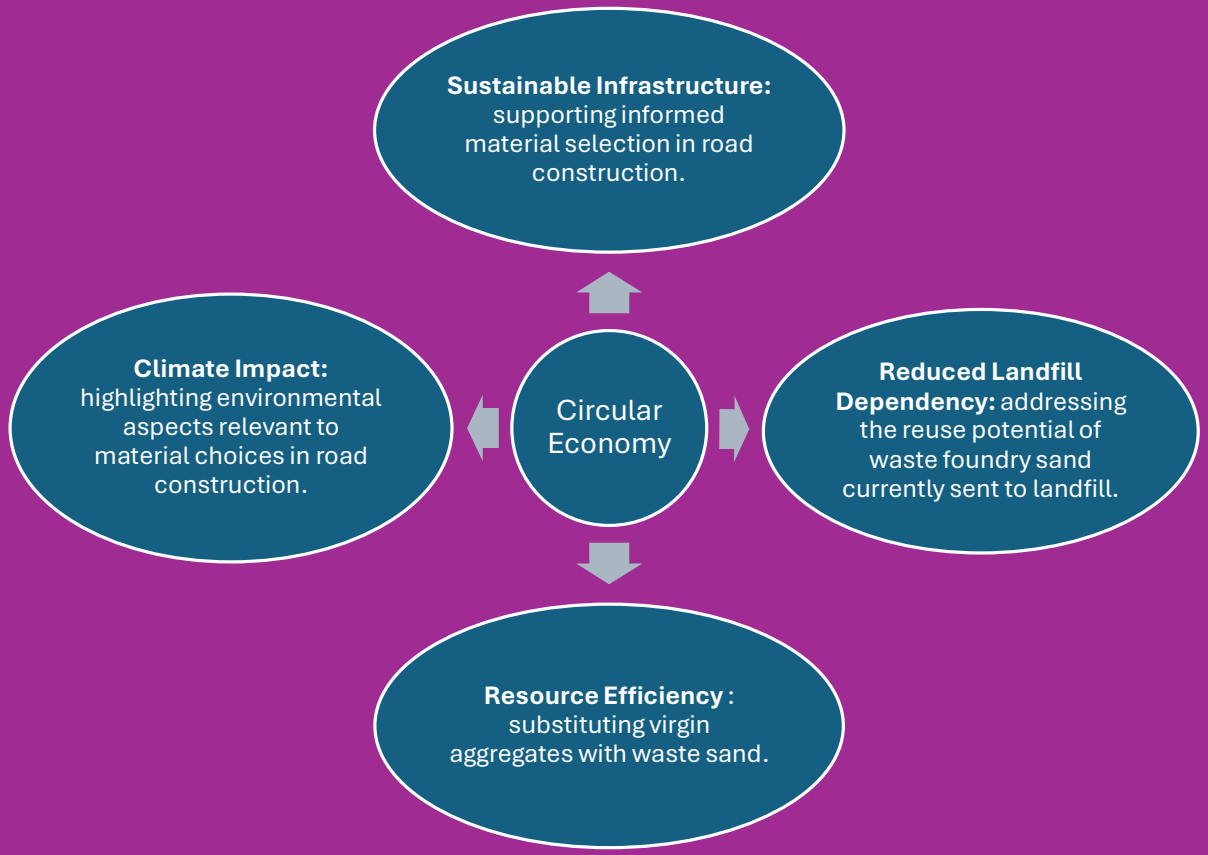
Evaluate WFS in unbound roadlayers

Assess:

- Mechanical performance
- Durability (freeze–thaw, soaking in water)
- Environmental safety (leaching)
- Develop a plan for pilot roads construction

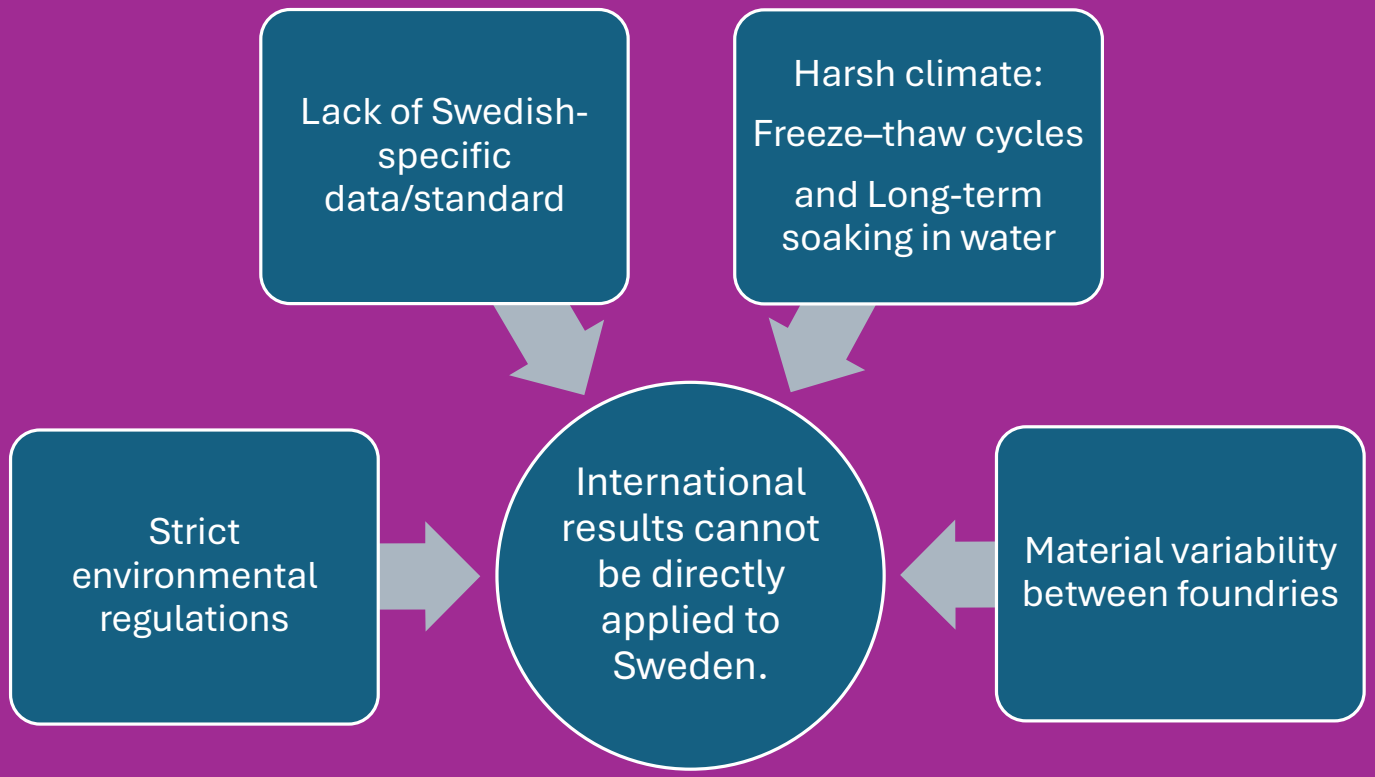
Swedish Metals & Minerals
impact innovation

Why It Matters: *Contribution to Swedish Metals & Minerals*



Swedish Metals & Minerals
impact innovation

Research Gap: *Why Sweden Needs This Study*



Swedish Metals & Minerals
impact innovation

Project Structure

WP1	WP2	WP3	WP4	WP5	WP6
Material Collection & Characterization	Laboratory Testing & Climate Simulations	Data Analysis & Statistical Evaluation	Environmental & Mineralogical Assessment	Stakeholder Engagement & End-User Validation	Knowledge Dissemination & Final Recommendations
Foundries provide WFS samples; initial testing of particle size, mineralogy, and contaminants.	VTI evaluates mixtures, bearing capacity, and durability under freeze–thaw and water exposure.	Analyze lab data to identify optimal WFS mixtures for unbound road layers.	Sibelco assesses compliance with Swedish environmental standards and mineralogical properties.	Collaboration with foundries, authorities, and contractors to validate practical applicability.	Share results via workshops, reports, and other publications.

Swedish Metals & Minerals
impact innovation

Early-Stage Results

Results from Åkers Sweden

Particle size (mm)	Retained (%)	Cum. Retained (%)	Passing (%)
2.00	0.00	0.00	100.00
1.41	1.60	1.60	98.40
1.00	7.70	9.30	90.70
0.71	15.72	25.02	74.98
0.50	22.49	47.51	52.49
0.36	21.89	69.40	30.60
0.25	19.91	89.31	10.69
0.18	8.92	98.23	1.77
0.13	1.41	99.64	0.36
0.09	0.26	99.90	0.10
0.06	0.07	99.97	0.03
<0.06	0.03	100.00	0.00

4. Tabell över resultat laktest av gjuterisand från CV2 (2025) mg/kg TS jämfört mot riktvärden för användning av avfall i anläggningsändamål

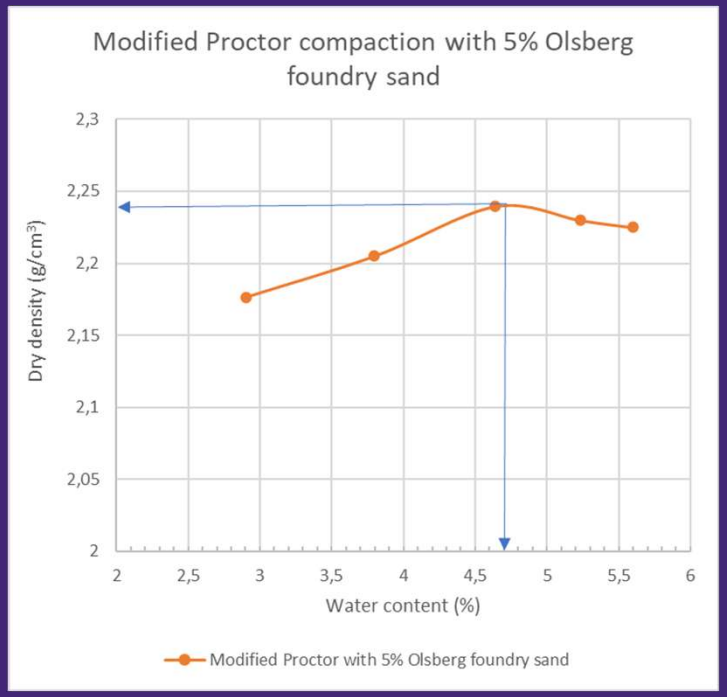
Resultat: Ledningssystem - Styrande - LE2522172_0_COA_Standard_sv-SE.pdf - Alla dokument

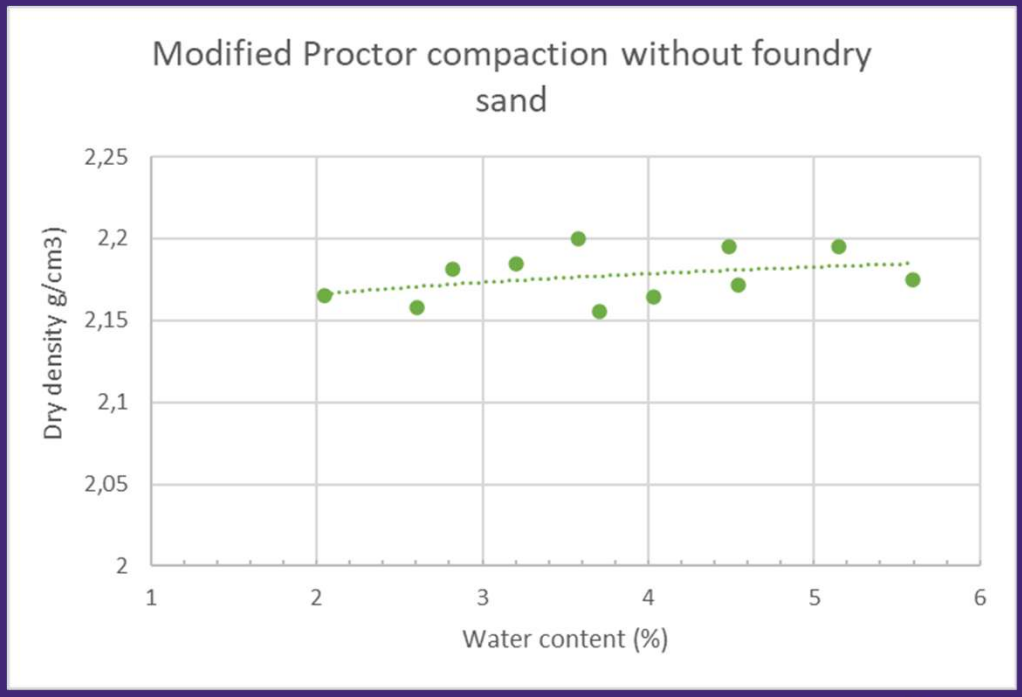
Ämne	Resultat	Gränsvärde anläggningsändamål LS/10*	Analysmetod
Arsenik	<0,007	0,09	S-LAK3-LS10-CC
Bly	0,00582	0,2	S-LAK3-LS10-CC
Kadmium	<0,0005	0,02	S-LAK3-LS10-CC
Koppar	0,0245	0,8	S-LAK3-LS10-CC
Krom	0,0564	1	S-LAK3-LS10-CC
Kvicksilver	<0,0002	0,01	S-LAK3-LS10-CC
Nickel	0,0391	0,4	S-LAK3-LS10-CC
Zink	<0,02	4	S-LAK3-LS10-CC
Klorid	<40	130	S-LAK3-LS10-CC
Sulfat	<41	200	S-LAK3-LS10-CC

*Naturvårdsverkets handbok för återvinning av avfall i anläggningsarbeten, ISBN 978-91-620-0164-3 (sida 47)

Swedish Metals & Minerals
impact innovation

Early-Stage Results





Swedish Metals & Minerals
impact innovation

Turning industrial waste into a reliable construction material is both a challenge and an opportunity

So

Let’s collaborate and stay in touch

Dina Kutta
Senior researcher at VTI
dina.kuttah@vti.se

Swedish Metals & Minerals
impact innovation