

NEWSLETTER · FOURTH ISSUE · SEPTEMBER 2026

MSA-TROUGH

FIXED-FOCUS SOLAR POWER

Fixed-focus parabolic-trough technology for low-cost, dispatchable, molten-salt concentrated solar power.

MAIN HIGHLIGHTS: Civil works contract awarded Mirror production started Second Webinar organised



The MSA-Trough collector — a fixed-focus concentrator with a detached, continuous absorber line.

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THE CONSORTIUM · SIX PARTNERS, SIX COUNTRIES



Innovation, performance and impact

MSA-Trough detaches the concentrator from a fixed absorber line of more than 0.8 km, removing the flexible joints at every collector inlet and outlet and reducing connection piping and heat tracing, which cuts cost, pressure drop and heat losses — while a horizontal “storm position” reduces wind loads by about 75%. The result is a lighter, cheaper collector for dispatchable power at 555 °C, using molten salt directly as both heat-transfer fluid and storage medium.

+24.5%

Higher annual electrical output vs. current parabolic-trough plants

-30%

Lower solar-field cost

555°C

Direct molten-salt operating temperature

-75%

Wind loads, thanks to the horizontal “storm position”

+2%

Optical efficiency gain from thin-glass sandwich mirrors

~90%

Wash-water recycled by the automatic mirror washer (+4% solar field performance thanks to daily washing)

0.8 km+

Continuous absorber line — no flexible field connections

350 m

Demonstration collector at EMSP (7.2 m aperture)

6

Partners across 6 countries, led by the University of Évora

PROJECT KEYWORDS

Modularity **Reliability** **Circularity** **Innovation**

Parabolic Trough **Concentrated Solar Power** **Molten Salt**

Renewable Electricity **System Stability** **Efficiency**

MAIN ACHIEVEMENTS

From components manufacturing to on-site construction

HEADLINE

Civil works contract awarded at EMSP

With the building permit and environmental approvals for the MSA-Trough collector in hand, UEVORA has completed the public tender for the civil works and a contractor has been awarded the contract. Construction at EMSP is scheduled to start in October 2026, as design is complete and the main components are being delivered.

DESIGN · COMPLETE

Design phase complete

The full collector and assembly-jig design is delivered: optimised torsion-box structure, bearings, sliding system, drive & controls, foundations, piping and the automatic mirror washer.

MIRRORS & MATERIALS

Mirror technology upgraded

The panels are a Glass Fibre Reinforced Polyester (GFP) sandwich with a recycled PET foam core and 1 mm thin glass, jointly engineered with DLR and FERRUM for about 2% higher optical efficiency than conventional thick-glass mirrors. Raw materials are in stock, the mould is complete and the first panels are being fabricated.



Galvanised collector parts at FERRUM, waiting for shipment to EMSP. (Credit: FERRUM)

MANUFACTURING

Absorber tubes received at EMSP

The absorber tubes, bearings and torsion compensators are provided, the redesigned sliding system is finalised for delivery in November 2026, and the mirror cones are on order for June 2027.

CONTROLS & TRACKING

Drive & control ready

RODAMA completed the control program and control boxes; final offers for the tracking unit and instrumentation are being reviewed before the order is placed.



Building the cavity of the panel mould at FERRUM. (Credit: FERRUM)

Structure & steelwork IN PROGRESS

FERRUM is manufacturing the collector structure and the assembly jig:

- All assembly-jig components have been manufactured — in-house plus outsourced laser-cut parts — and verified by DLR quality control.
- The pylons, front beams and torque boxes have been manufactured and galvanised; delivery to EMSP is scheduled for October 2026, and the collector parts manufacturing report (D2.2) is in preparation.
- Outsourced work covers laser cutting and galvanising; the galvanised parts are back at FERRUM and staged for shipment to EMSP.

Mirrors & materials IN PROGRESS

The mirror panels are a Glass Fibre Reinforced Polyester (GFP) sandwich, jointly defined with DLR:

- All raw materials are in stock: GFK sheets, recycled PET foam, adhesives and optical mirrors.
- DLR built the jig for the “single form structures” and assembled the first — the most critical step.
- The mould is complete and the first composite panels are being fabricated, ahead of series mirror manufacturing.

Patented components & tracking IN PROGRESS

DLR supplies the patented components; RODAMA the controls:

- Bearings and torsion compensators are provided; the new sliding system design is finalised, with provision due in November 2026, and the material order for the mirror cones has started, for provision in June 2027.
- The absorber tubes have been received at EMSP; basic parts in-house, complex parts outsourced.
- Control program and control boxes complete; final offers for the tracking unit and instrumentation are under review before ordering.

Balance of plant & logistics IN PROGRESS

Plant-connection components are procured and staged:

- The connection-pipe components have been received at FERRUM and the heat-tracing components are at the plant; all of them are still to be delivered to EMSP.
- Repair and tracing cables are installed; new electrical circuits await the specialised contractor.
- An optimised shipment series will follow once the structure and mirrors are complete.

Mirror washing device IN PROGRESS

A joint RODAMA–FERRUM build:

- All technical specifications are finalised and the structural components are complete.
- Most structural parts are ready, the components adapting the motor to the vehicle are still needed, and part of the functional system has been ordered for installation.

Foundations & site erection IN PROGRESS

UEVORA prepared the site works and approvals:

- Foundation extension parts are fabricated and the assembly jig parts are manufactured, both awaiting delivery and installation at EMSP.
- The construction permit application was accepted and the public tender completed, with a contractor awarded; the civil works are due to start in October 2026.



Bonding the thin-glass mirror strips onto a finished panel. (Credit: FERRUM)



A completed composite mirror panel, the first of the series. (Credit: FERRUM)

Erection at EMSP NEXT UP

With the parts made, WP3 moves the project from the workshop to the field. FERRUM leads the erection, with RODAMA on the drive and tracking, DLR on instrumentation and UEVORA on commissioning. The sequence runs from the assembly jig and the foundations to the 350 m structure, then the connection pipes, instrumentation and heat tracing, closing with commissioning and the filling with molten salt.

Getting ready to test the collector

IN PREPARATION

DLR leads the quality testing (WP4), with UEVORA and ENEA, and the groundwork is being laid while the collector is still being built. The collector will be characterised against ISO 9806, the temperature measurement set-up is defined and partly ordered, and a Matlab tool is being written to compare measured performance with the expected figures. Seven test campaigns follow once the collector stands, from optical measurement through to the final validation.

Planning how the plant will be run

IN PREPARATION

ENEA leads the work on operation and maintenance (WP5), with UEVORA, DLR, FERRUM and RODAMA, and testing starts once the collector is commissioned. Two night-time strategies are in preparation: draining the loop in the evening, and insulating the receiver, which a first design study at ENEA Casaccia puts at 23.27 W/m of heat loss, around 78% below the bare tube. Predictive control will hold the salt between 540 and 560 °C at part load, the washer will be optimised for cleanliness and water use, and nine months of operation will feed the maintenance plan.

Sustainability & life-cycle assessment

IN PROGRESS

OME leads the cradle-to-grave Life Cycle Assessment, built in step with the engineering and running to the end of the project. The bill of materials is complete for the main subsystems and the manufacturing model in SimaPro is close to finished. A first comparison with state-of-the-art technology, covering the steel structure and the foundations, puts MSA-Trough lower in every impact category assessed. The method and the first findings are set out in the webinar recap later in this issue.

Economic and market assessment

STARTED

FERRUM leads the work on costs, performance and market preparation (WP6), with DLR, OME, RODAMA, UEVORA and ENEA contributing. Investment and operating costs are being collected from all partners, DLR is simulating the annual electricity yield against a conventional parabolic trough, and the levelised cost of electricity will be compared with state-of-the-art solar thermal technologies. OME is assessing the socio-economic side, from jobs and local content to skills and community engagement, while the industrial partners prepare for market through scale-up, a manufacturing workshop and a commercialisation strategy.

DISSEMINATION & OUTREACH

Sharing results with the CSP community

Scientific conferences/papers

ONGOING

Two presentations led by ENEA were delivered in September 2026, bringing the project to three conference presentations of the six foreseen:

- The presentation “A next-generation parabolic-trough collector concept for low-cost, dispatchable, high-temperature solar thermal power” was presented at the ATI Conference in Milan, 9 to 11 September 2026.
- The presentation “Energy analysis-based design of an insulating cover for molten-salt parabolic-trough collectors” was presented at SolarPACES 2026 in Bad Neuenahr, 15 to 18 September 2026.



POLITECNICO
MILANO 1863
DIPARTIMENTO DI ENERGIA

81° CONGRESSO NAZIONALE ATI
MILANO 9 - 11 SETTEMBRE 2026

**ENERGIA PULITA
INDUSTRIA SOSTENIBILE:**
L'INNOVAZIONE PER UN PAESE STABILE E PROSPERO



Call for papers

81st ATI National Congress, Milan, 9 to 11 September 2026.



SolarPACES
Concentrating Solar Power, Thermal,
and Chemical Energy Systems

September 15-18, 2026
Bad Neuenahr, Germany

32nd SolarPACES Conference

32nd SolarPACES Conference, Bad Neuenahr, 15 to 18 September 2026.

The first informational paper

IN PROGRESS

The first of three plain-language informational papers, "Eco-design of a fixed-focus, molten-salt parabolic-trough collector: insights from the MSA-Trough project", is being drafted by OME.

LOOKING BACK · 7 JULY 2026

Webinar 2 recap: ecodesign in CSP manufacturing

ECODESIGN CONCEPTS IN CSP MANUFACTURING

For increased environmental and economic competitiveness — insights from the MSA-Trough project

Held on 7 July 2026 · Online via Microsoft Teams

The second MSA-Trough webinar asked how eco-design and technical innovation can make CSP manufacturing cheaper and cleaner at once. Manufacturing is where the stakes are highest: life-cycle studies put more than 60% of the environmental impact of a CSP plant in that phase. Coordinator Diogo Canavarro (UEVORA) opened with an overview of the project. Two presentations then set out the collector's innovations and the life-cycle approach behind them, before a roundtable, an open Q&A with the audience and a look at the next steps from ENEA.

THE PRESENTATIONS

Six innovations versus the state of the art

Martin Eickhoff · DLR

- **Fixed focus.** The concentrator turns around a static absorber, so one loop can use a continuous absorber line of up to 1 km with no flexible hoses, fewer heat and pressure losses and easy draining.
- **Storm position.** A horizontal park position cuts wind loads by about 75%, allowing a lighter steel structure and lighter foundations.
- **Thin-glass sandwich mirrors.** Light travels a shorter path through 1 mm glass, giving 1.9% higher optical efficiency.
- **Torsion compensators.** A wheel, cable and weight at the last pylon offset the summed bearing friction and keep the collector end on target.
- **Washing and drainage.** Daily washing with recycled water, and an overnight drainage strategy that avoids night heat losses, pump parasitics and impedance heating.
- **The eco-design link.** Fixed focus and storm position save steel and concrete directly; the other four save material indirectly, since a more efficient field can be smaller.

Life-cycle assessment as a design tool

Emanuela Menichetti · OME

- **Cradle to grave, on real data.** The LCA model is built alongside engineering, largely from primary data supplied by DLR, FERRUM and RODAMA.
- **A knowledge gap.** Over the past decade PV capacity grew more than eightfold against less than twofold for CSP, and PV studies draw 13 times more Scopus citations.
- **Manufacturing first.** The collector components, heat-transfer fluid and thermal storage are the main hotspots.
- **Supply chain.** Roughly two-thirds of the material mass of the main collector components is sourced in Europe.
- **Early results.** Foundations, support structure and mirrors are modelled; for the steel structure and foundations, MSA-Trough scores lower than the state of the art in every impact category assessed.

WHERE CSP LIFE-CYCLE IMPACTS ARISE (share of characterised impacts by phase; source: Corona et al., 2014, as presented by OME)

60–70%

MANUFACTURING · solar-field components, HTF, thermal storage

20–30%

OPERATION & MAINTENANCE

≤20%

BUILD + EoL

ROUNDTABLE & AUDIENCE Q&A · MODERATED BY DIOGO CANAVARRO (UEVORA)

Five questions, five perspectives

Questions raised by the audience in the live Q&A appear under the roundtable topic they relate to.

Q1

What have been the main challenges in terms of the collector design to adapt it to the MSA-Trough concept?

Daniel Morales · FERRUM

- Balance comes first: the centre of gravity must sit exactly on the rotation axis, which is also the absorber-tube axis, and the weight model counts everything down to screws, welds and mirror adhesives.
- The work is iterative. A change in panel weight moves the torsion boxes, and with them the triangular-beam fixings, the mirror supports and the assembly jig.
- The first concept, thin helical torsion tubes inspired by bamboo, proved hard to industrialise, so the design moved to torsion boxes in standard steel profiles: only cutting and drilling, little welding, flat-packed transport, stiffer than the tubes and lighter on material.

FROM THE AUDIENCE

How are the pylon bearings kept from overheating, given that the hot absorber tube passes through them?

A wide gap separates the absorber tube from the bearing body, and secondary mirrors limit the radiation reaching it. At Tabernas, bearing temperatures stayed at about 70 °C at most, so no special high-temperature bearings are needed.

Martin Eickhoff (DLR)

Q2

What type of eco-design concepts and tools have been applied to assess the sustainability of the system components?

Emanuela Menichetti · OME

- Environmental performance is treated as a driver of economic competitiveness, in line with the EU Competitiveness Compass, which the project predates.
- A life-cycle thinking approach covers every stage from raw materials to end of life. It builds on the earlier national project at Tabernas, which showed that design, material choice and quantities, supply chains and manufacturing processes shape both costs and impacts.
- A dedicated work package develops the cradle-to-grave LCA and the socio-economic assessment in step with the engineering, on primary industrial data rather than generic databases, and sensitivity analyses will test alternative materials, manufacturing routes and configurations for the wider CSP community.

Q3

Can you disclose some of the assessed efficiency improvement and the cost reductions achieved?

Martin Eickhoff · DLR

- Prototype costs say little; the benchmark is large-scale production, where cost approaches material cost. Against state-of-the-art collectors of similar aperture (about 7 m), MSA-Trough uses 45% less steel and more than 80% less concrete.
- The test campaign has not started yet. Mirror measurements already show 1.9% higher reflectivity for thin glass, which lifts overall efficiency by an estimated 2.17% for a 550 °C process.
- Further gains are expected from the torsion compensators, daily washing and a short focal length (1.36 m against 1.71 m), which makes concentration less sensitive to mirror errors.

FROM THE AUDIENCE

Has the degradation of the sandwich-type reflectors been assessed, and can their durability be guaranteed?

Similar sandwich mirrors installed some 12 to 13 years ago at the Plataforma Solar de Almería still show good reflectivity and a sound panel body. Durability at EMSP will be confirmed in the years after erection.

Martin Eickhoff (DLR)

FROM THE AUDIENCE

Have the lower wind loads been confirmed by wind-tunnel tests?

Not in a wind tunnel, but by a full-size test in storm position whose measured forces matched the simulations. Dynamic effects on very long collectors are not yet covered, and the demonstration will confirm the results.

Martin Eickhoff (DLR)

Q4

Among the various system innovations proposed, can you give one example and discuss the investigated options and the foreseeable applications beyond MSA-Trough?

Francisco Morales · RODAMA

- RODAMA's example is the modular automated cleaning system, designed to lower operating costs and water use. A fully integrated unit, with tanks, pumps and batteries on the collector, was ruled out for weight, structural load and maintenance.
- The chosen split architecture keeps only the light cleaning mechanism on the collector, while water supply, pumps and power ride on a ground carriage moving in sync with it. Water is collected, filtered and reused, with early results still to be validated in testing.
- Beyond MSA-Trough, the concept could serve other CSP plants, large PV installations and any infrastructure with large glass or reflective surfaces to clean.

FROM THE AUDIENCE

How does the need for demineralised washing water square with water scarcity at CSP sites, and could a water-neutral concept be integrated?

The washer doubles as a water-recovery system aiming at about 90% reuse, and washing in the morning, when condensation already wets the mirrors, needs far less water. True net zero is very hard, since some water stays on the mirrors or escapes through gaps, but washing water is small next to power-block cooling, and dry cleaning is difficult because CSP mirrors must be very clean.

Diogo Canavarro (UEVORA), Martin Eickhoff (DLR)

Q5

What would be your recommendations to improve the resiliency of the supply chain based on your experience so far?

Dirk Krüger · DLR

- Local production of renewable technologies makes local economies more resilient, and several parabolic-trough and Fresnel collectors are already made entirely in Europe. Imported parts are mostly vacuum receivers and mirrors, typically from China, although a Spanish supplier (Rioglass) also exists.
- In one supplier example, receivers and mirrors were only about 16% of customer CAPEX. Much of the rest, from site preparation and foundations to piping and balance of plant, is sourced locally anyway, so resilience is already high.
- The bigger threat is price: PV costs are falling fast. More parabolic-trough demonstrations and cost breakthroughs, such as a fixed-focus collector, are needed.

NEXT STEPS AND CONCLUSIONS · FRANCESCO ROVENSE (ENEA)

From manufacturing to on-site testing

Closing the session, ENEA summed up the day: the fixed-focus concept calls for specific solutions on centre-of-gravity alignment, optical accuracy and manufacturability; primary-data LCA is steering design choices; and the cost and efficiency potential is clear, although full experimental validation is still to come. With design complete and key components made or procured, the project now moves to EMSP in three steps.

STEP 1 ►

Months 14–36

Assembly, installation and commissioning

- Collector foundations and assembly jig
- Erection of the 350 m collector structure
- Absorber line, connection piping, drive and tracking
- Instrumentation, heat tracing and controls
- Commissioning and preparation for molten-salt filling

STEP 2 ►

Months 37–50

Experimental validation

- Optical measurement and alignment checks
- Stiffness and torsional behaviour tests
- Thermal efficiency at several operating temperatures
- Heat losses of the absorber line
- Incidence angle modifier and secondary mirror cone tests

STEP 3

Months 34–50

Operating strategies and O&M

- Demonstration of the overnight drainage strategy
- Night operation with extra receiver insulation, developed at ENEA Casaccia
- Part-load control of the outlet temperature near 550 °C
- Evaluation of the automatic mirror washer

SPEAKERS Diogo Canavarro (UEVORA, project coordinator and moderator) · Martin Eickhoff (DLR) · Emanuela Menichetti (OME) · Daniel Morales (FERRUM) · Francisco Morales (RODAMA) · Dirk Krüger (DLR) · Francesco Rovense (ENEA). The slides were shared with participants after the event and made publicly available through the [project's website](#).

MEETINGS

Meetings, reviewing progress

24 SEPTEMBER 2026 · ONLINE



5th General Assembly

The consortium met online on 24 September for its fifth General Assembly, with the project at month 36 of 50 and 16 deliverables approved. Partners reviewed every work package in turn, from the manufacturing of the assembly jig and collector parts through to the erection at EMSP, the test programme and the economic and environmental assessment. The day also covered quality and risk review, preparation of the second periodic report, and the deliverables and milestones due next.

2nd Periodic Review/General Assembly Meetings

A project meeting will be held on 13 January 2027 in Évora, Portugal, ahead of the second periodic review meeting, scheduled for 14 January 2027. The review will be held with the project officer and an external expert and will cover the second reporting period, from December 2024 to September 2026. The corresponding report is due at the end of November 2026.

13-14 JANUARY 2027 · SCHEDULED
UPCOMING

ABOUT · TEAM · CONNECT

The consortium behind MSA-Trough

MSA-Trough develops, installs and tests an industrial-scale, fixed-focus parabolic-trough collector for CSP plants. Visibly different from conventional designs, its innovative torque-frame structure improves optical efficiency while lowering investment cost. The technology is demonstrated at the Évora Molten Salt Platform — jointly managed by UEVORA and DLR — which offers unique conditions for large-scale molten-salt demonstration, validating the concept up to TRL 7 and the CAPEX/OPEX reductions needed for market uptake in southern Europe and North Africa.

SIX PARTNERS · COORDINATED BY THE UNIVERSITY OF ÉVORA



Deutsches Zentrum
für Luft- und Raumfahrt
German Aerospace Center



Italian National Agency for New Technologies,
Energy and Sustainable Economic Development



RODAMA

UEVORA — Universidade de Évora · Portugal (Coordinator)

FERRUM — Ferrum Tecnioindustrial · Spain

DLR — German Aerospace Center · Germany

ENEA — Italian Nat. Agency for New Technologies, Energy and Sustainable Economic Development · Italy

OME — Observatoire Méditerranéen de l'Énergie · France

RODAMA — Rodama Maquinaria · Spain



Évora Molten Salt Platform (EMSP) — the MSA-Trough demonstration site.

GET INVOLVED

Join our stakeholder network for updates and events. Researchers, engineers, manufacturers, policymakers and energy stakeholders are all welcome — get in touch through the form on our website.

FOLLOW THE PROJECT

Web: www.msa-trough.eu

LinkedIn: [MSA-Trough](#) · Bluesky: [@msa-trough](#)

Contact: contact@msa-trough.eu



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