



D4.3 Report on the development of the CoVEs network infrastructure for collaboration at international level



**Co-funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



Revision	Date	Author/Organisation	Description
1 st	23/02/2026	Michelangelo Mortello / IIS	First Version
2 nd	26/02/2026	Michelangelo Mortello / IIS	Final Version
3 rd	-	-	-

Summary

1. Context and purpose	4
2. Partner investments and use	4
A) CESOL (Spain) — Training modernisation and Spanish Living Lab enablement.....	4
Use in the educational process	5
Use in the Living Lab	5
Contribution to COVE-WENDT objectives	5
B) ISIM (Romania) — Digital delivery + hands-on capability for learning and prototyping	5
Use in the educational process	6
Use in the Living Lab	6
Contribution to objectives	6
C) CCIAT (Romania) — Outreach, coordination and member engagement capacity	7
Use in the educational process	7
Use in the Living Lab	7
Contribution to objectives.....	7
D) COMELF (Romania) — Practical welding capacity for training and skills competitions	8
Use in the educational process	8
Use in the Living Lab	8
Contribution to objectives	9
E) Miskolci SZC (Hungary) — Digital classrooms and hybrid delivery readiness	9
Use in the educational process	10
Use in the Living Lab	10
Contribution to objectives.....	10
F) IIS (Italy) — Mobile VR welding simulation to scale learning, safety and modern methods ...	10
Use in the educational process	11
Use in the Living Lab	11
Contribution to COVE-WENDT objectives	11
G) Brandware Media S.R.L. (Romania)	12
3. Overall impact and justification of investments (cross-partner)	12

4. Cross-cutting pedagogical transformation enabled by the investments.....	13
From instructor-centred to learner-centred environments	13
From static curriculum delivery to dynamic competence progression	13
From isolated training centres to interconnected digital ecosystems	13
5. Strengthening the Twin Transition (Green & Digital) – A Systemic Perspective.....	14
Digital Transition – Network-Level Effects.....	14
Green Transition – Operational and Educational Impact	14
6. Risk Mitigation and Long-Term Sustainability	14
7. Contribution to Quality Assurance and Monitoring	15
8. Scalability and Replicability Potential.....	15
9. Measurable Ecosystem-Level Added Value.....	16
10. Strategic Positioning of the COVE-WENDT Network.....	16

1. Context and purpose

COVE-WENDT (Centre of Vocational Excellence in Welding and Non-Destructive Testing) strengthens vocational excellence in welding and NDT by building dynamic skills ecosystems where VET centres, research institutes, universities, industry, public actors and civil society co-create solutions for the twin green and digital transition.

Within WP4 “Infrastructure development” and in support of WP2 (modern training delivery) and WP3 (Living Labs and innovation), project partners invested in targeted equipment that:

- modernises teaching spaces and hybrid delivery,
- enables digital, learner-centred learning pathways and evidence capture,
- improves accessibility and inclusion (multi-device learning),
- strengthens Living Lab capability for co-creation with SMEs and stakeholders,
- supports sustainability goals (paperless workflows, reduced rework through better training, efficient delivery).

The investments were intentionally “fit-for-purpose”: not generic IT, but an enabling layer to accelerate adoption of updated curricula, modular courses, micro-learning resources, and Living Lab activities aligned with market needs.

2. Partner investments and use

A) CESOL (Spain) — Training modernisation and Spanish Living Lab enablement

CESOL acquired advanced digital infrastructure and collaborative teaching devices to modernise delivery of welding/NDT training and reinforce the Spanish Living Lab (CESOL + SERCOBE + associated partners). The focus is hybrid learning, multimedia content production, simulation-ready computing capacity and paperless learner engagement directly aligned with WP2 and WP3.

CESOL		
Name of the purchased Equipment	No of Equipment Purchased	Product Specification
Desktop PC MSI MPG Infinite X2 14th	1	Processor Intel Core i9-14900KF 24-Core (3.20GHz, up to 5.2GHz, 64MB), video: NVIDIA GeForce RTX 4090 24GB, Memory: RAM 64GB DDR5 5600MHz (2x32GB), SSD: Phison 2TB ESR02BTLCZ-27J-2MS NVMe TLC, Windows 11 PRO
Interactive display Viewsonic IFP7552	1	Interactive display, resolutions: 4K UHD, Brightness: 400 nits, contrast: 4000:1, touchscreen, refresh rate: 60Hz, Lead time: 4 ms, SO based on Android 9.0 (up to 11.0), 32 GB, Data ports: 1 x RS232 1 x USB-C 1 x RJ-45 3 x USB-A, Audio port: 1 x Mini Jack, video ports: 3 x HDMI 2.0, 1 x DisplayPort 1.2, USB 3.0 x 4, USB 2.0 x 2, OPS PC x 1, Intel OPS x 1, LAN RJ45 x1, SPDIF x 1, Dimensions: 1720,1 x 1160.0 x 118.4mm, Weight: 56.8Kg
Tablet Lenovo	10	tablet lenovo p12, 8 gb, 128 gb, pen

Video-projector Samsung the Premiere LSP9T	1	Resolution: 4K Smart 3840 x 2160, Triple Laser 20.000 hours, Brightness: 2800 Lumen, Image max dimensions: 130", HDR, HLG, contrast: 2.000.000:1, Audio: Woofer, Bluetooth Audio, Mobil - TV - Mirroring, DLNA, WiFi Direct, DVB-T2CS2 Digital Broadcasting
Monitor	1	HP Monitor PC Gaming 68,6 cm (27") HP OMEN 27k, 144 Hz, UHD 4K, integrated audio, AMD Freesync Premium
Keyboard and Mouse	1	Logitech Slim Combo MK470
Laptop	1	Asus vivobook oled k3605vv mx197w i7 32gb 1tb ssd nvidia rtx 4060 8gb 16 w11
Video Cam	1	Logitech MeetUp

Use in the educational process

CESOL uses the workstation/laptop as the digital backbone for simulation, multimedia development, and structured digital documentation workflows (e.g., WPS/WPQR, inspection reporting). The interactive display supports real-time annotation, collaborative problem solving, and digital assessment. Tablets enable paperless distribution of standards excerpts, safety procedures, and learning resources, improving engagement while reducing printing.

Use in the Living Lab

The equipment supports stakeholder workshops, needs-mapping sessions, and hybrid technical seminars. High-performance computing enables demonstration workflows for digital documentation and introductory data handling. The display/projector/camera set supports co-creation events and dissemination, reinforcing collaboration with SMEs and regional actors.

Contribution to COVE-WENDT objectives

- Digital transition: hybrid delivery, multimedia content, digital assessment and evidence tracking
- Green transition: reduced paper use; better process understanding to reduce rework
- Skills ecosystem: strengthened Living Lab collaboration and stakeholder engagement

CESOL's equipment forms a coherent training + Living Lab infrastructure that increases training quality, accessibility and innovation capacity in line with COVE-WENDT KPIs and outcomes.

B) ISIM (Romania) — Digital delivery + hands-on capability for learning and prototyping

ISIM invested in a balanced set of assets for modern teaching, learner engagement, and a hands-on Living Lab environment supporting co-creation and demonstration with multi-actor participation.

Available equipment (as purchased)

ISIM		
Name of the purchased Equipment	No of Equipment Purchased	Product Specification
Desktop PC Workstation HP Z1 G9 Tower	1	Processor Intel Core i9-13900 24-Core (2.0GHz, up to 5.2GHz, 32MB), video: NVIDIA GeForce RTX 3070 8GB, Memory: RAM 32GB DDR5 4800MHz (2x16GB), SSD: 1TB Pcle - 4x4 2280 NVMe TLC, Windows 11 PRO
Interactive display, Samsung Flip Pro WM65B	1	Interactive display, resolutions: 4K UHD, Brightness: 350 nits, contrast: 4000:1, touchscreen, refresh rate: 60Hz, Lead time: 8 ms, Tizen 6.5, 32 GB, Data ports: 1 x RS232 1 x USB-C 1 x RJ-45 3 x USB-A, Audio port: 1 x Mini Jack, video ports: 2 x HDMI 2.0, 1 x DisplayPort 1.2, Dimensions: 1522.4 x 897.6 x 62.9mm, Weight: 39.7Kg
eBook Reader Kindle Amazon Scribe Touchscreen 64GB Wi-Fi	10	Display: e-paper 10.2-inch, Touchscreen, Memory: 64 GB, Interface: USB type C, Wireless, Supported formats: AZW, AZW3, DOC, DOCX, EPUB, HTML, MOBI, PDF, PRC, TXT, GIF, JPEG, PNG; Weight: 433g, Dimensions: 229x5.8x289mm
Video-projector Samsung the Premiere LSP9T	1	Resolution: 4K Smart 3840 x 2160, Triple Laser 20.000 hours, Brightness: 2800 Lumen, Image max dimensions: 130", HDR, HLG, contrast: 2.000.000:1, Audio: Woofer, Bluetooth Audio, Mobil - TV - Mirroring, DLNA, WiFi Direct, DVB-T2CS2 Digital Broadcasting
Pico 160 Cel Puls Welding Machine with Accessories	1	Welding processes: TIG DC, Electrode, Pulsed Electrode, Welding current: MMA 10-150A; TIG 10-160A, Idle voltage: 105V, Supply voltage: 230 V (-40 % ... +15 %), Nominal max. power: 5.5kW, Dimensions: 430 x 115 x 225mm, Weight: 4.8 Kg, Safety class: IP 23, Standards: IEC 60 974-1; -10 / CE / S-Safety sign / EMC class A

Use in the educational process

The workstation supports simulation/visualisation and structured handling of welding/NDT learning assets. The interactive display enables collaborative learning, annotation of discontinuities and acceptance criteria, and evidence capture for learner portfolios. The e-readers support paperless learning in workshop-friendly form. The welding machine provides controlled practical training (TIG DC / MMA, including pulsed mode), creating a direct feedback loop between parameter selection, bead quality, inspection and quality thinking.

Use in the Living Lab

The equipment anchors co-creation workshops (interactive display), supports small digital workflow demonstrators (workstation), and enables production of representative samples (welding machine) for demonstration and training artefacts.

Contribution to objectives

ISIM's setup directly supports modern, learner-centred training (WP2) and practical Living Lab prototyping (WP3), reinforcing both digital competences and green outcomes via reduced printing and reduced rework through better process control.

ISIM's investment creates a robust "theory–digital–practice–evidence" learning journey aligned with COVE-WENDT's competency-based approach.

C) CCIAT (Romania) — Outreach, coordination and member engagement capacity

CCIAT equipped itself to support project dissemination, member engagement, and coordinated activities with ISIM. The aim is to professionalise outreach to Chamber members, promote job fairs and guidance actions, and facilitate hybrid collaboration and communication—strengthening the regional skills ecosystem.

Available equipment (as purchased)

CCIAT		
Name of the purchased Equipment	No of Equipment Purchased	Product Specification
Video-projector Samsung the Premiere LSP7T	1	Resolution: 4K UHD — 3840 × 2160 pixels (true 4K quality), Ultra-Short Throw (UST), 20.000 hours, Brightness: 2200 ANSI lumens, Image size 90" – 120" diagonally: HLG, contrast: 2.000.000:1, HDR10+ & HLG formats for enhanced dynamic range,
Monitor DELL P2723QE	1	27-inch 4K UHD (3840 × 2160) IPS display monitor, 4K UHD 3840 × 2160 @ 60 Hz, 16:9, Brightness: ~350 cd/m ² , Contrast Ratio: 1000:1, 1 × USB-C, 4 × USB 3.2, 1 × HDMI
Workstation HP Z2 G9 Tower	1	Processor Intel Core i9-13900 24-Core (2.0GHz, up to 5.2GHz, 32MB), video: NVIDIA GeForce RTX 3070 8GB, Memory: RAM 32GB DDR5 4800MHz (2x16GB), SSD: 1TB PCIe, USB-A, USB-C, audio in/out, Windows 11 PRO
Laptop Dell Latitude 5540	1	Intel Core i7-1370P, 15.6inch, RAM 32GB, SSD 1TB, Intel Iris Xe Graphics, Windows 11 Pro, Grey, Screen Size: 15.6", Full HD 1920 × 1080
Logitech MeetUP Camera	1	Max Resolution: 4K Ultra HD (3840 × 2160), Frame Rate: Up to 30 fps at 4K, 5x HD zoom, Field of View: Super-wide 120° diagonal

Use in the educational process

CCIAT uses the equipment to present programme structure, course opportunities, and Living Lab benefits to members—both on-site and during external events. High-quality display and projection improve clarity of digital learning materials and enable professional delivery of briefings, information sessions and guidance moments.

Use in the Living Lab

CCIAT's role is enabling: facilitating meetings, supporting coordination with ISIM, and hosting hybrid sessions that connect Chamber members to Living Lab opportunities (needs mapping, consultation, recruitment of participants for training and innovation activities).

Contribution to objectives

The investment increases visibility, accessibility, and uptake of project services among regional companies and stakeholders, strengthening the "governance and ecosystem" dimension of COVE-WENDT.

CCIAT's equipment strengthens the ecosystem layer: communication, engagement, and effective mobilisation of companies and stakeholders.

D) COMELF (Romania) — Practical welding capacity for training and skills competitions

COMELF invested primarily in welding equipment and accessories to modernise practical training, host skills competitions, and support an applied Living Lab model with regional industrial participation.

COMELF			
Partner Name	Name of the purchased Equipment	No of Equipment Purchased	Product Specification
COMELF Bistrita ROMANIA	Welding Machine Speedtec 400SP	5	-maximum welding current=420A/DA 100%;multiproces inverter for welding:MIG/MAG;MIG/MAG PULSATTIG(DC and DC pulsat.High efficiency procedures:SSA-speed short arc;SSP-shft silent pulse;HPS-high penetration speed
	Wire Feder LF56D	5	Components of welding machine
	Coolarc-60	5	Components of welding machine
	WELDING TORCH-LINGUN-PROMIG 400-5M	5	Components of welding machine
	CABLE,PACK SPIN WATER TM-TM 95 MM-23M	5	Components of Welding machine
	CART 4WHER	5	Components of welding machine
	Freezool	9.6L	Components of Welding machine
	Bester MIC 200-S	2	Device for instruction
	Bestee S 171	2	Device for instruction
	External nozzle	2	Device for instruction
	Contact wire	10	Device for instruction
	Eurospeed LS	7	Device for instruction
	SQUARE	5	Device for instruction
	ROULETTE 3M	5	Device for instruction

Use in the educational process

This equipment expands hands-on capacity (multi-station delivery), supports higher throughput of learners, and enables structured practice on advanced MIG/MAG and pulsed processes. The multi-process, high-efficiency configurations allow training aligned with modern production needs and quality targets (reduced defects, improved repeatability), supporting competence-based assessment.

Use in the Living Lab

The equipment supports demonstration and prototyping sessions where SMEs and stakeholders can observe process settings, discuss parameter selection, and co-create practical training scenarios based on real production challenges—directly supporting the Romanian Living Lab model.

Contribution to objectives

COMELF's investment strengthens the “practice backbone” of the ecosystem: high-quality practical learning, competitions, and applied experimentation capacity, with clear relevance to employability and industry uptake.

The equipment consolidates COMELF's role as a practical anchor for training delivery and skills competitions, enabling scalable, industry-relevant hands-on learning.

E) Miskolci SZC (Hungary) — Digital classrooms and hybrid delivery readiness

Miskolci SZC invested in classroom-level digital infrastructure to strengthen delivery of modern VET: multi-PC capacity, interactive teaching, tablets for flexible access, and high-brightness projection suitable for large training rooms.

Available equipment (as purchased)

MISKOLCI SZC			
Partner Name	Name of the purchased Equipment	No of Equipment Purchased	Product Specification
Miskolci SZC	SKC Avtek TouchSreenTS8 Mate 65-WordWall3 Full Pro	1	65", 4K UHD, 350 cd/m ² brightness, 5000:1 contrast ratio, 40-point IR touch, 3 mm Mohs 7 tempered glass, Android 13, 4 GB RAM, 32 GB storage, 2x16 W speakers, Wi-Fi + LAN, 360 W power consumption, dimensions: 1488x897x87 mm, weight: 35 kg, dual-color writing support, WordWall3 Full Pro license.
Miskolci SZC	Lenovo ThinkCentre M70 (SFF)	10	Small Form Factor business PC with Intel Core i5 (10th–12th Gen), 8–16 GB DDR4 RAM, 256–512 GB M.2 SSD, Intel UHD Graphics, Gigabit LAN, HDMI + DisplayPort, multiple USB 3.2 ports, low-profile PCIe expansion, Windows 10/11 Pro compatible.
Miskolci SZC	HPC VGA NVIDIA GT 1030 2GB videokártya	10	NVIDIA GeForce GT 1030 GPU, 2 GB GDDR5 memory, 64-bit memory interface, PCIe x16, HDMI + DVI outputs, low-profile design, suitable for basic graphics, 4K video playback, and light gaming.
Miskolci SZC	Samsung tablet Galaxy Tab A9+(11"Wi-fi)64 GB	10	11" TFT/IPS display (1920x1200), Wi-Fi model, Snapdragon 695 processor, 4 GB RAM, 64 GB storage (microSD expandable), 7040 mAh battery, 8 MP rear + 5 MP front camera, dual speakers with Dolby Atmos, USB-C, Bluetooth 5.1, Android 13, slim 6.9 mm metal body.

Miskolci SZC	EPSON EB-L530U lézer projektor	1	Laser projector, 5200 lumens brightness, WUXGA (1920×1200) resolution, 2,500,000:1 dynamic contrast, 3LCD technology, 20,000-hour laser light source, HDMI ×2, HDBaseT, USB, LAN, wireless optional, motorized lens shift, 1.35–2.20:1 throw ratio, suitable for large classrooms and conference rooms
--------------	--------------------------------	---	--

Use in the educational process

The multi-PC setup enables group training, digital exercises, and modular learning delivery. The interactive screen supports real-time annotation and active learning methods (problem solving, quizzes, collaborative review). Tablets provide flexible access to learning resources and support blended learning pathways. The laser projector ensures reliable visibility for technical content and multimedia demonstrations in larger rooms.

Use in the Living Lab

These assets support workshops and stakeholder-facing sessions by providing a professional, interactive environment for demonstrations, discussions and competence needs mapping, also suitable for hybrid participation when required.

Contribution to objectives

The investment upgrades digital teaching capacity and scalability, supporting digital transition goals while improving access and inclusiveness through multi-device availability.

Miskolci SZC's equipment modernises the training environment and strengthens readiness for learner-centred, blended delivery aligned with updated curricula.

F) IIS (Italy) — Mobile VR welding simulation to scale learning, safety and modern methods

Within the Italian skills ecosystem (IIS + CALEF consortium and industrial contexts such as ECOR and WT), IIS invested in a portable Virtual Reality welding simulator to strengthen modern training delivery and Living Lab capability. The goal is to enhance learner engagement, increase safety and accessibility, and enable scalable training modules aligned with the project's digital transition and modern pedagogy (simulation-based learning, modular pathways, evidence-based assessment).

Available equipment (as purchased)

IIS			
Partner Name	Name of the purchased Equipment	No of Equipment Purchased	Product Specification
IIS	RTEX® 360 Compact simulator	1	small, portable Virtual Reality Welding Simulator for mobile use in multiple environments.

Use in the educational process

The VR simulator is used to:

- introduce and reinforce fundamental welding motions and procedural discipline in a safe environment,
- support learner-centred repetition and formative feedback without immediate material consumption,
- prepare learners before workshop time, improving efficiency of practical sessions and instructor time,
- enable modular learning (short sessions, targeted skill elements) consistent with competence-based progression.

By combining simulation practice with subsequent real workshop activities, IIS strengthens “transfer to practice” while reducing early-stage errors and improving overall training effectiveness.

Use in the Living Lab

In Living Lab settings, the simulator supports:

- demonstration sessions for stakeholders and SMEs to showcase modern training approaches,
- co-creation of training scenarios linked to real industrial needs (e.g., qualification-oriented skills, repeatability),
- outreach activities across different sites thanks to portability (training rooms, events, partner facilities).

This supports the Italian Living Lab ambition of linking training innovation with industrial environments and stakeholder engagement.

Contribution to COVE-WENDT objectives

- Digital transition: use of simulation, modern learning methods, modular delivery, digital feedback loops

- Green transition: reduced consumable waste during early skill acquisition; fewer retries once in the booth
- Skills ecosystem: portable tool enabling broader outreach and consistent training experiences across settings

IIS's VR simulator is a strategic investment that strengthens scalability, safety, accessibility and modern pedagogy—supporting both WP2 training innovation and WP3 Living Lab dissemination and co-creation.

G) Brandware Media S.R.L. (Romania)

Brandware Media S.R.L.			
Partner Name	Name of the purchased Equipment	No of Equipment Purchased	Product Specification
Brandware Media SRL	Laptop	1	Laptop Lenovo IdeaPad Slim 3 15IAH8 procesor Intel® Core™ i5-12450H 4.4 GHz, 15.6", Full HD, IPS, 16GB, 512GB SSD, Intel® UHD Graphics, Windows 11
	Laptop	1	Laptop Lenovo IdeaPad Pro 5 14AHP9 procesor AMD Ryzen™ 5 8645HS 5.0 GHz, 14", 2.8K, OLED, 120Hz, 16GB LPDDR5x, 1TB SSD, NVIDIA® GeForce RTX™ 3050 6GB GDDR6
	Monitor	1	LED IPS Lenovo ThinkVision T27p-30, 27", UHD (3840x2160), 60Hz, 4ms, Anti-glare, 99% sRGB, HDMI, DisplayPort, USB Type-C, RJ45 1G, Pivot
	Monitor	1	MONVG28UQL1A TUF VG28UQL1A 28 4K UHD IPS 144Hz 1ms
	Audio – video conference system	1	Jabra PanaCast Meet Anywhere+ Videokonferenz-Bundle - Kamera, Panorama + Jabra Speak 750
	Tablet computer	1	Apple 13" iPad Air (M2): Liquid Retina Display, 128 GB, 12 MP Front camera
	Monitor	1	GIGABYTE M32U 31.5" 4K UHD Monitor - 3840 x 2160 (UHD), 144Hz, 1ms, KVM, 350 cd/m², FreeSync Premium Pro, DisplayHDR400, HDMI 2.1, DisplayPort 1.4
	Laptop	1	Ultrabook Lenovo 14" Yoga 7 2-in-1 14IML9, 2.8K OLED 120Hz Touch, Procesor Intel® CoreC Ultra 7 155H (24M Cache, up to 4.80 GHz), 16GB LPDDR5X, 1TB SSD, Intel Arc, Win 11
	WYSIWYG Editor license	1	Froala Editor License and Maintenance
	Quiz / survey license	1	SurveyJS Basic Developer license

3. Overall impact and justification of investments (cross-partner)

Across partners, the equipment investments deliver a coherent “enablement layer” that accelerates:

- implementation of updated curricula and modular courses (digital classrooms, interactive teaching, learner devices),
- high-quality hybrid delivery and dissemination (projectors, cameras, interactive screens),

- Living Lab co-creation and stakeholder engagement (workshop-ready collaboration infrastructure),
- practical capacity and excellence activities (welding equipment for training and competitions),
- sustainability outcomes through paperless workflows and better first-time-right competence development.

These investments are therefore not isolated purchases, but operational tools directly supporting the project's outputs, KPIs and long-term sustainability of the CoVE network after project funding.

4. Cross-cutting pedagogical transformation enabled by the investments

Beyond the individual partner deployments, the equipment investments collectively represent a structural shift in the pedagogical model of the COVE-WENDT network.

The transition is visible in three dimensions:

From instructor-centred to learner-centred environments

Interactive displays, tablets, VR simulation and multi-PC classrooms enable active participation, annotation, digital assessment and iterative feedback. Learners are no longer passive recipients of content but active contributors to problem-solving sessions, simulation exercises and modular skill acquisition pathways.

From static curriculum delivery to dynamic competence progression

The equipment supports micro-learning, modular learning outcomes (aligned with EQF and ECVET), digital evidence capture and structured validation of competences. This enhances transparency, traceability and comparability of skills development across countries.

From isolated training centres to interconnected digital ecosystems

The hybrid-ready infrastructure (cameras, projectors, collaborative screens, digital platforms) strengthens transnational cooperation, peer exchange and cross-border dissemination of best practices.

These investments therefore act as enablers of systemic transformation rather than simple infrastructure upgrades.

5. Strengthening the Twin Transition (Green & Digital) – A Systemic Perspective

While each partner contributes locally, the combined investments generate measurable cross-network effects in support of the twin transition.

Digital Transition – Network-Level Effects

- Standardisation of digital teaching tools across multiple countries
- Increased capacity for hybrid and remote participation in training and Living Lab sessions
- Enhanced data literacy in welding/NDT contexts (documentation handling, simulation, visual analysis)
- Integration of simulation and digital workflows in competence development

This alignment creates a shared digital baseline across the CoVE network, increasing interoperability and future scalability.

Green Transition – Operational and Educational Impact

The green contribution is not limited to reduced paper use. It extends to:

- Improved first-time-right welding performance due to simulation and parameter optimisation
- Reduced material waste in early skill acquisition phases (VR and structured practice)
- Promotion of efficient welding processes (pulsed, advanced multi-process machines)
- More efficient training logistics (hybrid sessions reduce unnecessary travel where appropriate)

Collectively, these factors reduce resource consumption while improving quality and competence levels.

6. Risk Mitigation and Long-Term Sustainability

The investments significantly reduce operational risks for the CoVEs:

- Pedagogical continuity risk: hybrid-ready equipment ensures continuity in case of mobility restrictions or local disruptions.
- Technology obsolescence risk: modern GPU-ready workstations and interactive systems ensure compatibility with evolving software tools and e-learning solutions.
- Engagement risk: immersive and interactive tools (VR, collaborative screens) increase attractiveness of VET, particularly for younger learners.

From a sustainability perspective:

- Equipment is modular and reusable beyond project duration.
- Devices are integrated into permanent training infrastructures.
- Living Lab activities generate continued stakeholder engagement and potential service contracts.
- Enhanced infrastructure increases eligibility for future EU funding (Erasmus+, Horizon, national funds).

These investments therefore strengthen the economic and institutional sustainability of the CoVEs.

7. Contribution to Quality Assurance and Monitoring

The infrastructure investments directly enhance quality assurance mechanisms within the project:

- Digital evidence captures (interactive boards, recorded sessions)
- Portfolio-based learner assessment
- Improved traceability of training outcomes
- Structured documentation workflows

This reinforces WP2 and WP3 quality loops and supports future European/international certification processes coordinated by EWF and IIW.

8. Scalability and Replicability Potential

The equipment model adopted by partners demonstrates high replicability across additional VET centres.

Key scalable features include:

- Portable VR simulation (IIS model)
- Hybrid-ready classroom packages (Miskolci SZC model)
- Practical multi-station welding infrastructure (COMELF model)
- Outreach-focused digital engagement setup (CCIAT model)
- Integrated digital + Living Lab classroom environment (CESOL and ISIM models)

The diversity of investments reflects contextual needs while maintaining a coherent strategic direction, making the approach adaptable across regions.

9. Measurable Ecosystem-Level Added Value

At consortium level, the investments contribute to:

- Increased learner capacity across partner countries
- Higher participation in skill competitions and Living Lab activities
- Strengthened SME engagement through professional demonstration environments
- Increased visibility and attractiveness of welding and NDT careers
- Improved cross-border harmonisation of digital teaching standards

The combined infrastructure reinforces the credibility of the COVE-WENDT network as a reference model for vocational excellence in welding and allied processes.

10. Strategic Positioning of the COVE-WENDT Network

Through these coordinated investments, the consortium positions itself not merely as a group of training providers, but as:

- A distributed innovation-enabled VET ecosystem
- A transnational demonstrator of digitalised welding education
- A practical enabler of green manufacturing competence
- A structured bridge between industry needs and training supply

The equipment investments are therefore strategic assets that underpin the long-term positioning of the CoVE network as a European reference in welding and NDT vocational excellence.