Interreg CENTRAL EUROPE

Co-funded by the European Union

JETforCE

D.2.1.3 Transnational pilot 2 – Interim monitoring, evaluation and improvement report

Final version

9/2025

Table of Contents

Introduction

The report provides a summary of the results of the interim evaluation of Transnational Pilot 2, carried out by the Monitoring Committee during the joint sessions organised at the 5th and 6th project meeting in Weiz and Telč. The report contains data collected from all PPs involved in the testing of the Digital evaluation tool, and also it provides recommendations for subsequent phases. Transnational Pilot 2 serves as the backbone of the JETforCE piloting phase, playing a key role in advancing JETforCE's vision of leveraging digital technologies to drive a Just Energy Transition in Central Europe (CE). Its objective is to maximise the impact of investments in energy-efficient and renewable (green) technologies while ensuring social equity. A central element of this pilot is the Technology Evaluation Tool—a newly developed, co-created software designed to assess the costs and benefits of both existing and proposed technologies for green energy production, distribution, and consumption.

For the purpose of this report, project partners were invited to prepare and deliver inputs to the WP2 leader, IRENA, and included in this report are their contributions and findings.

1.Transnational Pilot 2 – Evaluating and deploying Just Energy Transition responsive technologies

Following the successful completion of JETforCE Transnational Pilot 1 in period 4 of the project (October 2024 – March 2025), the JETforCE partners officially launched the second pilot action, "Evaluating and deploying Just Energy Transition responsive technologies." This action, which forms the backbone of the JETforCE piloting phase, is divided into two stages: Stage 1 focused on testing the Technology Evaluation Tool (D.1.4.1) in partner regions to analyse various technologies and propose solutions to challenges identified in Pilot 1; meanwhile, Stage 2 concentrates on the practical implementation of selected technologies through case studies. Central to this process is the Technology Evaluation Tool—an innovative, co-created software designed to assess the costs and benefits of both existing and proposed technologies for green energy production, distribution, and use. By advancing this work, Transnational Pilot 2 plays a crucial role in JETforCE's approach to leveraging digital technologies to enable a Just Energy Transition in Central Europe, aiming to maximize investments in energy efficiency and renewable technologies while safeguarding social equity.

1.1 Transnational Pilot 2 STAGE 1: Testing the tool for Technology Evaluation

The testing process of the Technology Evaluation Tool was carried out at local and regional levels, with project partners engaging JETAs, stakeholders, and staff members. To test the Technology Evaluation Tool at the project level, several online coordination workshops were held (18 July 2024, 7 November 2024, and 26 February 2025). These sessions, organised and led by EIfI-Tech with the active participation of all project partners, served primarily to exchange testing results and discuss necessary improvements.

The following sections summarise the types of technologies tested and the initial findings.

LP-BORA94 reported that testing of the first three technologies took place on 27 November 2024 with the involvement of one staff member responsible for energy planning and managing ERDF-funded renovation projects for local municipalities. This staff member also participated in the 5th project meeting in Weiz, Austria (2–4 December 2024), where the partnership held in-depth discussions on how to improve the tool. Internal testing was repeated on 21 March 2025, after a major tool upgrade made possible through extensive online and in-person exchanges.

PP4 - Città Metropolitana di Bologna (CMBO) conducted a practical test focusing on renewable energy technologies. Their report highlighted that the tool was valuable in evaluating projects but also pointed out areas for improvement. While the tool enabled detailed assessments, refinements were recommended to enhance usability and strengthen impact analysis.

PP6 - LEASP (Slovenia) tested three technologies implemented between 2017 and 2022, focusing on good practices in local municipalities where they had been directly or indirectly involved in planning investments in

energy efficiency and renewable energy. The selected technologies included thermal insulation of facades to reduce heat loss, heat pump installation as a replacement for fossil fuels and photovoltaic systems for renewable energy production and storage. LEASP's contribution involved providing documentation from energy concepts, audits, and archives, complemented by data from municipal partners. Their findings confirmed that all three technologies continue to deliver positive social, economic, and environmental benefits, demonstrating both effectiveness and sustainability. In the second phase, LEASP expanded testing to the City of Ptuj and the Municipality of Dornava, focusing on technologies already implemented or planned with subsidy support: rooftop solar plants in Ptuj, a heat pump for Dornava's municipal building and cultural hall, and LED lighting upgrades at Dornava Elementary School. Assessments covered economic (cost reduction), environmental (emission reduction), and social (quality of life) benefits. LEASP concluded that the tool provided meaningful insights, deepening understanding of technology impacts at multiple levels.

PP7 - IRENA (Croatia) focused its testing on staff members and Local JETA participants. Early testing concentrated on identifying issues with the tool and reporting suggestions to the developer, Elfi-Tech. After the Weiz meeting, IRENA began collecting ideas for the second piloting phase, testing the most suitable technologies for addressing challenges identified in Pilot 1.

PP8 - EAV (Czech Republic) tested the tool internally following an introductory session on 18 July 2024, then introduced it to local JETA members on 22 October 2024. Feedback was shared during the Weiz meeting (3–4 December 2024), after which an updated version was presented to local JETA members on 7 February 2025. EAV tested three investments completed between 2017 and 2022, as well as three ideas from Pilot 1, focusing on previously identified challenges.

PP9 - SIEA (Slovakia) initially tested the tool internally with project managers Andrej Slančík, Lucia Bogdányová, and Zuzana Palugová, who entered data related to building energy performance. Two technologies—solar panels and biomass boiler replacement—were presented during the Weiz meeting. The tool was later showcased at national events in 2024 and 2025, reaching more than 160 participants, including Slovak JET Alliance representatives. In the second testing phase (February–March 2025), the same two technologies were evaluated alongside three additional building efficiency solutions. External testers from the IT sector described the tool as complex and requiring clearer guidance, underlining the need for improved user-friendliness.

PP12 - WEIZ (Austria) tested the tool internally twice – first in late 2024, when significant improvements were still required. A hands-on workshop during the Weiz partner meeting supported its refinement, and by January 2025 a new version was available. This was tested again internally with implemented technologies and later with those identified through the global Challenge Mapping Tool. Results were shared transnationally, and the tool was presented at a local JETA event, where evaluated technologies were showcased. The project team (Andrea Dornhofer, Katharina Halper, Günther Maier, and Tanja Frieß) participated actively in both test cycles, later joined by an energy agency employee for feedback. The demonstrations attracted strong interest from JETA members, confirming the tool's relevance.

1.2 Analysed technologies in partner countries

1.2.1. Application of the tool to test 2017-2022 investments

As outlined in the previous chapter, the testing process in Stage 1 was divided into two phases. In this initial stage, project partners tested three technologies that had already been implemented during the 2017–2022 period. In Phase 2, they were asked to test three new technologies or investments designed to address the challenges identified in Transnational Pilot 1.

This section presents the analysis of the tool based on the 2017–2022 investments, and each partner was invited to contribute to the report by describing one of the three selected technologies/investments.

LP - BORA 94 among other investments, tested the energetic modernisation of municipal buildings in Aszaló. Between June 2019 and June 2022, the primary school in Aszaló underwent a major energetic modernisation. Works included façade and attic insulation, replacement of all windows and doors, installation of 14 photovoltaic panels with a 5-kW inverter, and a new 45 kW condensing gas boiler. The building was also made barrier-free. The project reduced fossil energy consumption by 1,612.53 GJ/year and cut CO_2 emissions by 110.59 tons annually. The total cost was about €403,000, with annual energy savings of €8,300. Although no new jobs were created, 22 people were involved in the implementation. Five public consultations ensured local engagement, and the investment was accessible to marginalised groups while raising awareness of renewable technologies. The project scored 75% in the Technology Evaluation Tool, confirming photovoltaic modernisation as highly suitable for public buildings, with benefits for both the municipality and future generations.

PP4 - Metropolitan City of Bologna as one of the investments tested the Italian Superbonus 110% programme. The programme launched in 2020, provides a 110% tax deduction for energy efficiency upgrades, renewable energy installations, and seismic risk reduction in residential buildings. Widely applied in Emilia-Romagna, it has reduced energy use and emissions while stimulating the construction sector. The programme mobilized over €11.6 billion in investments and created an estimated 153,000 jobs nationally. Savings of 5.65 GWh/year were recorded, with CO_2 emissions reduced by about 900,000 tons annually. However, access for low-income groups was uneven, and tight deadlines created risks for citizens and SMEs. The initiative scored 67%, reflecting its strong socio-economic impact despite challenges in accessibility and implementation.

PP5 - Bautzen Innovation Centre introduced in the testing the Big Battery Lausitz, built in 2019–2020. It represents a large-scale energy storage system developed by a former lignite mining company transitioning towards renewables. It supports grid stability and reduces reliance on coal. The €25 million project involved 100 employees, created 10 jobs, and is expected to deliver a return on investment within 10 to 20 years. It reduces CO_2 emissions by 1,100 tons and coal use by 1,400 tons annually. Although it has little direct community involvement, the project diversifies regional energy supply and fosters strategic partnerships. It scored 54%, a fair rating for a pilot project with mainly indirect benefits.

PP6 – Local Energy Agency Spodnje Podravje from the 2017-2022 period has chosen the solar power plant and energy storage installed at the Vrtec Destrnik kindergarten. The €65,724 project, co-financed by EU and national funds, increased the municipality's renewable energy share from 21% to 24% and is expected to save 2.6% in energy costs. The system reduces CO_2 emissions by about 9.1 tons per year and produces 46 MWh of renewable electricity annually. Strong community engagement, consultations, and training events ensured broad support and knowledge transfer. The project scored 82%, recognized as both feasible and impactful, though challenges remain with recycling PV and battery materials.

PP7 – IRENA – Istrian Regional Energy Agency, in 2014 installed one of the first small PV plants on a public building in Istria, equipping the Čepić elementary school with 24 modules (6 kWp capacity) and battery storage. With a cost of €23,380, the project generates savings of €1,200 annually, reduces CO_2 emissions by 1.76 tons, and cuts electricity use by 7,500 kWh per year. It also supports education and accessibility for marginalized groups. The project achieved a 71% evaluation score, showing strong environmental and social value for a modest investment.

PP8 – Energy Agency Vysičiny for the initial testing purposes has chosen the Energy retrofitting of a medical center. From 2017 to 2020, the medical center was retrofitted with building insulation, new windows, and a gas heat pump. The €119,450 project improved energy efficiency and indoor climate. It reduced CO_2 emissions by 20.3 tons and fuel use by 118.21 MWh annually. Energy savings reached €3,788 per year. The ROI was negative without subsidies but positive (19.1%) with support. With limited public engagement, the project scored 53%, reflecting moderate benefits and the importance of financial aid for similar efforts.

PP9 – Slovak Innovation and Energy Agency for the initial testing of the tool has chosen the installation of PV panels. In the tested project, in just three months, solar panels were installed on 50 buildings. The €718,200 investment saves about €469,000 in energy costs, creates 4 jobs, and involved 7–8 employees. The project cut CO_2 emissions by 158 tons and reduce fuel consumption by nearly 23.8 million kWh annually. The project scored 91%, highlighting its efficiency and strong environmental impact.

PP10 – Lodzkie Region for their testing has chosen the comprehensive thermal modernisation of public buildings in the Dobron Commune. Between 2016 and 2018, Dobroń Commune modernised 12 public buildings, including schools, housing, and municipal facilities. The €20 million project improved insulation, efficiency, and air quality. The investment reduced CO_2 emissions by 129.7 tons annually and cut electricity use by 602 MWh, while also lowering fuel consumption in 21 households. Savings exceeded €1.5 million. With a 93% evaluation score, the project stands out for its large-scale environmental and economic benefits, despite limited social indicators.

PP12 - Weizer Energy and Innovation Centre introduced in the testing the SoWeitConnected project. Over three years, Thannhausen municipality implemented SoWeitConnected, a direct line system linking households to a municipal PV plant, enabling local electricity sharing without grid costs. The €160,000 project saves €20,000 annually, with an expected ROI of 8 years. It also cuts CO_2 emissions by 7.7 tons and reduces electricity consumption by 36,750 kWh yearly. Community co-creation workshops and public consultations ensured strong local engagement. The initiative improved accessibility, fairness, and education, and was supported by strategic partnerships.

Across the analysed investments, a clear pattern emerges: energy efficiency measures, renewable energy generation, and storage systems consistently deliver strong environmental and economic benefits, though their social impacts vary. Projects such as the Dobroń Commune modernisation (PP10) and the Slovak solar panel rollout (PP9) achieved exceptionally high evaluation scores (93% and 91%) due to their large-scale reductions in CO_2 emissions and significant cost savings. Smaller-scale initiatives, like the Čepić elementary school PV plant (PP7) and Aszaló school modernisation (BORA 94), also proved highly effective in cutting emissions and energy use, demonstrating that modest investments can generate meaningful local impacts, particularly in public buildings serving children.

Programmes with broader socio-economic ambitions, such as Italy's Superbonus 110% (PP4), showed substantial national-level benefits in job creation and energy savings, though accessibility challenges limited their equity outcomes. Pilot and transition projects like the Big Battery Lausitz (PP5) and Solar + Storage in Destrnik (PP6) highlighted the importance of innovation and community involvement. While the battery project provided mainly indirect benefits, the Destrnik initiative scored highly for its strong community engagement and contribution to long-term resilience.

Overall, the evaluation scores ranged from 53% (PP8), reflecting limited returns without subsidies, to over 90%, underscoring how project design, scale, and social inclusion influence success. The most impactful investments combined technical efficiency with strong social and educational components, ensuring benefits reached both municipalities and vulnerable groups. Moving forward, optimizing recycling processes, securing financial support mechanisms, and deepening citizen engagement will be key to maximizing the long-term value of these technologies across Central Europe.

1.2.2. Application of the tool for tackling PA1 challenges

This section presents the analysis of the JETforCE Technology Evaluation Tool applied to three types of technologies selected for Phase 2 testing. Unlike Phase 1, which focused on already implemented investments, Phase 2 explores potential new solutions that could be used to address the challenges identified in Transnational Pilot 1. The analysis provides insights into the technical, economic, environmental, and social

dimensions of these technologies, highlighting their capacity to support the energy transition in Central Europe while ensuring balanced socio-economic impacts.

Since the comprehensive analysis was introduced in the deliverable D.2.3.1, in this section, a selection of technologies and results will be presented. For each partner involved in pilot testing, one technology/investment will be presented.

LP - BORA 94 introduced in testing process the energy renovation of the Mayor's Office in Monaj. Over a two-year period, the Municipality of Monaj plans to renovate the Mayor's Office by insulating façades, plinths and attic floors, replacing windows and doors, modernising the heating system (including a shift to a biomass boiler), installing a small-scale rooftop PV system, and ensuring full accessibility. The investment totals 28,890,214 HUF (≈ €72,330) and is expected to save about 134,430 HUF/year (≈ €337/year), implying a payback of roughly 25 years. Environmentally, the project would reduce emissions by 9.76 t CO_2/year and electricity use by 34.5 MWh/year. Socially, it improves access, fairness, and stakeholder awareness, with benefits reinvested locally. Funded entirely through EU ERDF, the project aligns with the municipality's SECAP. The Technology Evaluation Tool awarded 52%, noting modest economics but solid socio-environmental value.

PP4 - Metropolitan City of Bologna has chosen the national incentive programme Conto Termico for their pilot testing. Conto Termico is a national incentive programme that reimburses part of the cost of energy-efficiency and renewable upgrades (e.g., solar, heat pumps, efficient systems) in public and private buildings. With reported investment volume of €2,000,000,000 and 1.6 TWh/year energy savings, it supports an estimated 40,000 jobs and typical paybacks of 5–7 years. The programme can cut emissions by about 500,000 t CO_2/year, reduce electricity consumption by up to 20%, and encourages use of recycled materials (≈ 30%). While accessibility barriers remain for low-income households and SME cash-flow risks exist due to payment delays, training and partnerships strengthen market capacity. The tool score of 86% reflects strong environmental and socio-economic impact under supportive national policies and financing via GSE incentives.

PP5 - Bautzen Innovation Centre for one of their tested investments can chose the project of municipal heating network of Radibor. Radibor (≈3,000 residents) plans a public heating network with local heat generation, complemented by a citizen energy cooperative. Over roughly 10 years, the project foresees ~€12 million in costs, ~30% average household energy-cost savings, ~5 new jobs (≈ 100 people involved), and an ~20-year ROI. Expected impacts include ~25% GHG reduction and ~35% lower fuel use, alongside broad inclusion (benefits for all households, targeted engagement and consultations). Financing will likely blend public funding, EU grants, loans and private/community capital. The initiative earned 97% in the tool, recognizing exemplary early-stage community involvement and sound policy alignment.

PP6 - Local Energy Agency Spodnje Podravje during their pilot testing, as one of three technologies has chosen the project of introducing the water-to-water heat pump in the Municipality of Dornava. Planned for 2025-

2026, Dornava will replace fossil heating in a municipal building and cultural hall with a water-to-water heat pump. The project cost is €244,000 (≈ €154,000 own funds; €90,000 subsidy), delivering ≈€23,500/year savings (≈ 40% cut in heating electricity costs), a 15.3% annual return, 6.5-year payback, and a 129% 15-year return. Emissions are expected to fall by ~52 t CO_2/year, electricity use by ~38% (from 333,000 to 206,000 kWh), with a switch from gas to renewable electricity and ~13,000 m^3 less gas consumed annually. The project features communication, consultation, inclusion measures, and education via the Eco Fund (ENSVET), plus partnerships with BORZEN and local installers. The case demonstrates strong environmental and economic feasibility with clear community benefits.

PP7 - IRENA — as one of the possible projects for tackling the challenges reported through Transnational Pilot 1 has chosen addressing the shortage of qualified labor in the energy sector by organizing practical workshops with high school students. Building on earlier training cycles, the current project involves the installation of an aerothermal air-to-water heat pump (12 kW) and two solar power plants (8.1 and 9 kW) in Labin. The installations will be carried out directly by students of Mate Blažine Secondary School under expert supervision, providing them with valuable hands-on skills while delivering tangible benefits to the community. The photovoltaic systems are placed on the Singles' Home, reducing energy costs for socially vulnerable groups, while the heat pump contributes to reducing fossil fuel dependence at the school. Economically, the total investment amounts to €49,200 (€29,200 for the PV plants and €20,000 for the heat pump), with expected annual savings of €2,700 from the solar systems and €1,400 from the heat pump. The payback period is estimated at 11 years for the PV plants and 15 years for the heat pump. Environmentally, the installations will reduce CO_2 emissions by around 7.95 tons annually (5.27 tons from the PV systems and 2.68 tons from the heat pump), along with saving approximately 31,800 kWh of electricity and replacing 1,700 litres of fuel oil each year. The initiative scored 76% in the Technology Evaluation Tool, reflecting strong environmental and social benefits. While the return on investment is relatively long, the project successfully combines education, community support, and sustainable energy deployment, making it a valuable model for inclusive and future-oriented energy transition.

PP8 - Energy Agency Vysočiny for the testing of the Digital Evaluation Tool has chosen the project of installing PV Power Plant at ZOO Jihlava. ZOO Jihlava plans rooftop PV across its facilities (about 9 months to implement) to cut one of the city's highest municipal electricity loads. The €165,000 project is expected to save €16,461/year, create 1 job (with 7 staff involved), achieve ~11% ROI and a ~10-year payback, and increase revenue by ~3%. Environmental gains include ~86 t CO_2 avoided and ~80 MWh/year of clean electricity; recycled content is estimated at ~40%. Public meetings, education, and partnerships are planned to build support and awareness. Despite these benefits, the tool assigned 27%, likely reflecting limited "just transition" attributes; nonetheless, the project advances municipal decarbonization and public engagement.

PP9 - Slovak Innovation and Energy Agency have chosen planned energy refurbishment of one public school. A two-month envelope insulation project for a public school targets substantial energy and emissions

reductions. With €2,610,000 in total costs and projected savings of €1,292,675, the initiative creates ~20 jobs (and involves ~20 staff), with a projected 12-year ROI and 8.34% incremental revenue growth. Environmental outcomes include ~5,000 t GHG reduction and ~30% lower fuel use. Social indicators are strong on engagement (≈ 80%) and education (≈ 100%), with solid partnership activity. The project leverages EU decarbonization funds and delivers healthier indoor conditions and lower operating costs for a widely used public facility.

PP10 - Lodzkie Region introduced in pilot testing the replacement of Heat Sources in Osjaków. Between March 2020 and December 2022, Osjaków replaced 52 outdated heat sources in single-family homes with pellet boilers (10), gas boilers (4), and air (22) and ground (16) heat pumps. The investment totalled PLN 4,858,689.72 (≈ €1.16 million) and is expected to reduce emissions by ~202.6 t CO_2/year. Financed by the Regional Operational Programme, the project improves air quality, lowers household energy bills, and mitigates energy poverty, with temporary jobs during implementation and outreach to promote the new technologies. The tool awarded 62%, reflecting meaningful environmental and social benefits delivered through local government action.

PP12 - Weizer Energy and Innovation Centre as one of their projects have chosen the solar heating system for district heating Weiz. The Weiz biomass district-heating operator plans to add a solar heating system within one year to lower fuel use and operating costs. With reported investment of €75,000 (and additional financing options via KPC and municipal loans), the project anticipates ~€20,000 in annual energy-cost savings, ~2.5-year payback, 2 new jobs (≈ 10 people involved), ~1.5 t CO_2 savings, and ~15,000 kWh/year less electricity use. Socially, district-heating connections can replace aging oil and wood stoves, improve air quality and ease burdens on elderly residents; meanwhile, local firms manage installations and maintenance, taking the financial burden off the individual citizen.

The Phase 2 testing of the JETforCE Technology Evaluation Tool examined a diverse set of projects, reflecting both infrastructural investments and innovative community initiatives. LP – BORA 94 analysed the renovation of the Monaj Mayor's Office, combining biomass heating and photovoltaics, which, despite modest savings, delivered notable environmental benefits. PP4 – Bologna presented Conto Termico, a large-scale national incentive programme achieving strong economic and environmental results. PP5 – Bautzen explored the municipal heating network in Radibor, designed with community involvement and receiving one of the highest scores. PP6 – Spodnje Podravje proposed a water-to-water heat pump for municipal buildings in Dornava, with significant emission reductions and strong economic feasibility once implemented. PP7 – IRENA focused on workforce development through student-led installations of a heat pump and PV systems, combining education with social inclusion and renewable energy benefits. PP8 – Vysočiny assessed a PV installation at ZOO Jihlava, which showed strong environmental benefits but a lower score in terms of just transition criteria. PP9 – Slovakia presented a school insulation project with large emission reductions and cost savings, highlighting the value of efficiency measures. PP10 – Lodzkie Region focused on replacing outdated heating sources in Osjaków, improving air quality and reducing energy poverty in rural households. Finally, PP12 – Weiz developed a solar heating system for district heating, showing quick payback, environmental benefits, and strong community

engagement. Together, these investments demonstrate the tool's flexibility in assessing projects ranging from small-scale local initiatives to national programmes, while highlighting trade-offs between economic returns, environmental performance, and social impacts.

1.3. Transnational Pilot 2 STAGE 2: Testing validated technologies through case studies

In Stage 2 of Transnational Pilot 2, and building on the results of Stage 1, three case studies were launched to test proposed technologies: the regional energy supply sector (led by PP7–IRENA), public buildings (led by PP8–EAV), and community heating and electricity for a historical area (led by PP12–WEIZ). This stage serves as a test bench to validate the suitability of JETforCE solutions, helping to identify key challenges and address them through appropriate technologies, while also moving towards tangible energy savings. The transnational work is coordinated by WP2 leader IRENA, with continuous input from demo sites and their JETAs. All other partners contribute to monitoring, evaluation, and improvement.

Stage 2 officially began in Period 4 (October 2024 – March 2025), with initial activities including technology acquisition, installation, validation, and early testing supported by data collection. An interim monitoring and evaluation session was held during the 6th project meeting in Telč, where the committee reviewed the first phase and formulated recommendations for improvement.

The following chapters provide a concise description of the three pilot cases.

PP7 – IRENA Case Study: Regional Energy Supply Sector (Istria, Croatia)

In the Istrian County, the JETforCE solution focuses on addressing a pressing regional challenge: the shortage of skilled workers in the energy supply sector. To tackle this, IRENA launched a programme of capacity-building workshops with students from the Mate Blažina Secondary School in Labin. The initiative combines education and practical training with renewable energy deployment, ensuring that young people gain hands-on experience in installing photovoltaic (PV) systems and heat pumps.

As part of the pilot, students installed an 8.1 kWp solar PV plant on a public building used to accommodate socially vulnerable groups. This installation became operational in 2025 and is already reducing energy bills for residents. A second PV plant of 9.45 kWp, funded by the City of Labin, began installation in May 2025 under IRENA's coordination and technical support. In addition to energy savings and emissions reduction, the project provides social benefits by lowering costs for disadvantaged communities and fostering local workforce development.

Looking forward, activities include completing the second installation, analysing its performance using the JETforCE evaluation tool, and expanding upskilling and reskilling workshops. The case study demonstrates how

renewable energy investments can simultaneously deliver environmental benefits, support vulnerable groups, and build the skilled workforce needed for a just energy transition.

PP8 – Energy Agency Vysočiny (EAV) Case Study: Energy Management in Bystrouška Kindergarten (Czech Republic)

The Energy Agency Vysočiny (EAV) piloted the JETforCE approach through the implementation of energy management (EM) systems in public buildings, with a focus on Bystrouška Kindergarten in Jihlava. The kindergarten, which accommodates 100 children, was opened in September 2019 following a €3.6 million investment, supported by €1.3 million in public funding. It is designed as a nearly zero-energy building (nZEB), combining innovative design with advanced renewable energy technologies. Special features of the facility include boarding services and a polytechnic workshop "Water World," which integrates a whirlpool and sauna.

The building's energy concept relies on a mix of gas heat pumps for heating, solar thermal panels for hot water production, photovoltaic panels for electricity generation, and advanced ventilation and cooling systems. In Stage 2 of the Transnational Pilot, the focus was on deploying IoT-based smart metering and energy management software to optimize performance. Real-time data collection on electricity and gas consumption enables operators to better manage building systems, identify inefficiencies, and reduce unnecessary energy use.

From a technological standpoint, the kindergarten already represents a premium example of modern sustainable construction. The added value of the pilot lies in demonstrating how digital tools and monitoring can help operate such facilities more responsibly and efficiently, ensuring that their full energy-saving potential is realized. The case illustrates how innovative energy management in public buildings can combine environmental responsibility with long-term cost savings and improved service provision for communities.

PP12 – WEIZ Case Study: Community Heating and Electricity for the Historical Area "Schlossgasse" (Austria)

The WEIZ pilot focuses on the historical district of Schlossgasse, located next to the Basilica Weizberg and the local biomass district heating plant. The aim is to modernise and decarbonize the area's energy infrastructure while respecting its cultural heritage. This integrated project combines several infrastructure upgrades: laying 4.7 km of new pipelines to extend biomass-based district heating to 18 buildings (including two multi-family houses and 16 single-family homes), upgrading the electricity grid with 35 new connections, installing fibre optic internet for 15 users, implementing intelligent LED street lighting at 13 points, and renewing the local water supply.

By integrating heating, electricity, digital, and public services into a single coordinated effort, the project significantly reduces greenhouse gas emissions while improving efficiency and resilience. Social benefits are

also central, as households gain access to reliable renewable heating, affordable energy, and modern infrastructure, supporting the area's long-term liveability.

Economically, the project ensures stable energy prices through biomass heating and reduces costs over the long term, while also strengthening local service providers and construction companies involved in the works. The Schlossgasse case demonstrates how modern energy and infrastructure systems can be deployed in historical areas in a way that balances heritage preservation, sustainability, and social inclusion.

2. Monitoring and evaluation

2.1 Monitoring of the pilot action implementation

The pilot activities were monitored by the Monitoring Committee, established in line within the D.2.1.1 Methodology. Each project partner appointed one representative. With regard to Transnational Pilot 2, two Monitoring Committee sessions were held: the first during the 5th project meeting in Weiz (Austria) in December 2024, and the second alongside the 6th project meeting in Telč (Czech Republic) in May 2025. The Weiz session focused on evaluating the progress of Stage 1, with partners providing valuable feedback to WP2 and PA2 leaders for improving the Technology Evaluation Tool and preparing it for further testing. At the Transnational Monitoring Committee meeting in Weiz, partners agreed that additional refinements were necessary to ensure that the final results would achieve a high level of quality.

This chapter presents the contributions of partners on how the pilot process regarding STAGE 1 was performed at the local level, with monitoring feedback provided by each involved PP:

Hungary (LP – BORA94): The pilot action was implemented as planned. Initial testing was carried out in October and November with one staff member and three JETA members, including a Digital Ambassador. Further testing took place in March 2025, and additional trials are planned with JETA members and decision-makers once the final version of the tool is available.
Italy (PP4 - MCBO): The pilot was successfully implemented in close cooperation with stakeholders, ensuring alignment with local needs. Active engagement of participants contributed to the smooth execution of activities.
Slovenia (PP6 - LEASP): The pilot was carried out effectively, with structured timelines and strong municipal involvement (Ptuj and Dornava). Some challenges in data collection arose due to varying documentation practices, but these were resolved through standardization. Overall, the tool proved effective for evaluating economic, environmental, and social impacts.
Croatia (PP7 - IRENA): Despite initial challenges with the tool's functionality, the piloting phase was successfully completed. IRENA staff tested the tool with different inputs to better understand its operation and potential applications.
Czech Republic (PP8 - EAV): Implementation followed a structured process. After testing the first version of the tool, partner feedback was incorporated into an updated version. This was then tested again with employees and JETA members using completed investments (2017–2022). The process was timely, well-managed, and improved the tool's usability and relevance.

Slovakia (PP9 - SIEA): During the first phase of testing, the tool was trailed internally within the project team, as the application was still under development. In the second phase, due to tight schedules in February 2025, communication with Slovak JETA members was carried out primarily online.

Poland (PP10 - Lodzkie): The first testing round was complicated by the absence of a clear rating system and confusing question design. These issues were largely resolved in later stages, leading to more effective testing.

At the Monitoring Committee session in Telč, the discussions centred on progress within Transnational Pilot 2 and the planning of subsequent activities. The session, managed by IRENA as part of WP2, opened with an introduction to the Fourth Transnational Monitoring Committee meeting. Partners then reviewed and discussed the D2.3.1 Final Report of Transnational Pilot 2 – Stage 1: "Evaluating and deploying just transition responsive technologies", jointly prepared by IRENA and EIfI. Attention then turned to the evaluation of PA2 Stage 2, where IRENA, WEIZ, and EAV presented the current status, outlined upcoming activities, and emphasised the involvement of other partners. Finally, IAAI and EIfI provided an update on the JETforCE digital tools, highlighting their current status and exploring options for their further use.

2.2 Risk management protocol

Risk management was an integral part of the pilot action implementation, ensuring continuity and minimizing disruptions. Potential risks were identified early, assessed for their impact, and addressed through pre-emptive measures. A flexible and adaptive approach allowed for quick responses to emerging challenges, while ongoing monitoring ensured that new risks were promptly mitigated. Challenges such as delays in securing stakeholder confirmations, limitations in the analytical scope of the tool, and difficulties in obtaining necessary documentation were managed through early communication, the inclusion of qualitative insights, and close collaboration with local authorities. Effective stakeholder engagement and structured problem-solving strategies played a crucial role in maintaining stability and achieving the project's objectives.

2.3. Transnational Monitoring Committee Meetings

Two Transnational Monitoring Committee meetings were held to oversee the implementation of Pilot 2 and ensure high-quality results. The first took place during the 5th project meeting in Weiz, Austria, and focused on reviewing progress in Stage 1. Partners provided valuable feedback on the use of the Technology Evaluation Tool, which guided improvements and prepared the ground for further testing. The second meeting was organized alongside the 6th project meeting in Telč, Czech Republic, where partners discussed the Final Report of Stage 1, evaluated the current status of Stage 2, and addressed upcoming activities. This session also included a review of the JETforCE digital tools, focusing on their usability and potential future applications.

Together, these meetings played a crucial role in ensuring transparency, refining the tool, and maintaining strong coordination among partners.

2.4. Evaluation of the impact of the pilot action

In the table 1 are listed figures achieved by the time of preparing the report (after the two Monitoring Committee sessions – Weiz and Telč:

Table 1: Pilot action 2 key performance indicators – STAGE 1 & 2

No	Name of the indicator	Measurement unit	Value	Target
1.	PA2 STAGE 1- Testing the tool for technology evaluation	Number of test launches at the local level	9 - 1HU, 1IT, 1DE, 1SI, 1CZ, 1SK, 1PL 1AT, 1HR	1 per partner
2.	Analysis of 2017-2022 technologies	Number of tested investments/technologies from the 2017-2022 period	27 - 3HU, 3IT, 3DE, 3SI, 3CZ, 3SK, 3PL 3AT, 3HR	3 per partner
3.	Technologies to address challenges identified in PA1	Number of technologies selected to address challenges identified by users of the Challenge Mapping Tool in PA1	27 - 3HU, 3IT, 3DE, 3SI, 3CZ, 3SK, 3PL 3AT, 3HR	3 per partner
4.	PA 2 STAGE 2- Testing validated technologies trough case studies	Number of launches at the local level	3 – 1xIRENA, 1xEAV,1xWEIZ	3 IRENA, EAV, WEIZ
5.	Technology acquisition, installation, validation and testing	Number of successfully purchased, installed and tested technologies	3 – 1xIRENA, 1xEAV,1xWEIZ	3IRENA, EAV, WEIZ
6.	Study visits	Number of organised study visits for the project partners	2 – 1XWEIZ, 1XEAV	3 IRENA, EAV, WEIZ

3. Recommendations for improvement

The chapter contains a detailed explanation of what should be improved in the Digital Evaluation Tool at the time of preparing the report, how project partners can motivate the broader audience to use the tool and how the collected data (challenges) can help project partners in improving and designing policy instruments at the local and regional level.

For the purposes of preparing this Transnational Pilot 2 Interim Report (D.2.1.3) and Final Report of Transnational Pilot 2-STAGE 1(D.2.3.1) document, partners were invited to provide their contribution to the improvement of the app and Transnational Pilot 2 in general and their feedback is presented in the following paragraphs.

To assess the effectiveness of the application, project partners evaluated eight criteria using a grading scale from 1 to 5. The average scores were as follows: Usability (3.57), Functionality (3.43), Performance (4.00), Customization/Personalization (3.00), Accuracy and Reliability of Results (3.14), Data Security and Privacy (3.80), Integration with Other Tools/Systems (4.00), and Overall User Experience (3.57). These results suggest that performance and integration were the strongest features, while customization and clarity of results require further improvement.

In addition to scoring, partners provided detailed comments and suggestions. A recurring theme was the need for clearer explanations of the final score. Several partners reported inconsistencies between scores shown on the final page and those presented in downloaded PDF reports, which created confusion. Many suggested that the tool should provide a narrative interpretation of results, possibly through a matrix or KPI-based system, to help users understand whether a project is suitable for implementation and how results should inform decision-making.

Another common suggestion was to improve user interface and usability. Feedback highlighted the need for a more intuitive design, easier navigation, persistent log-ins, clearer labels (e.g., replacing “Total score” under each answer with “Answer score”), and streamlined instructions at the start of the process to help first-time users. Partners also recommended addressing minor technical issues, such as problems with the back button and ambiguous percentage-based questions in the environmental section.

On the functionality side, proposals included enabling multiple uses of the tool without restarting, incorporating customisable features tailored to regional contexts, and integrating real-time data or benchmarks for more accurate and context-specific insights. Suggestions also emphasised the importance of multilingual support, additional guidelines before the evaluation process begins, and providing targeted recommendations on how to improve underperforming areas (e.g., energy efficiency or renewable energy integration).

Finally, partners underlined the importance of continuous improvement through regular updates and ongoing collection of user feedback. Sharing the tool with stakeholders at the regional level was seen as a priority, as it could support decision-making and the broader adoption of sustainable technologies.

Top 5 Recommendations for Improving the Application:

Priority Area	Recommendation	Expected Benefit
1. Clarification of results	Provide clear explanations of final scores (e.g., KPI-based narrative, threshold matrix, or suitability index).	Helps users understand outcomes and supports informed decision-making.
2. User interface & navigation	Improve design for better accessibility: persistent log-ins, clearer labels (e.g., "Answer score"), and fixes for back button issues.	Enhances usability and reduces user confusion.
3. Multiple tests & restarting sessions	Add functionality to allow multiple technology tests in one session without restarting.	Increases efficiency and practicality for users working on several cases.
4. Guidance & instructions	Include introductory guidelines, examples, and possibly multilingual support before starting the evaluation.	Supports first-time users and improves inclusivity across regions.
5. Targeted improvement suggestions	Integrate automated recommendations (e.g., highlight areas with low performance and propose corrective actions).	Helps stakeholders act on results and align projects with sustainability goals.

4. Conclusion

The interim monitoring and evaluation of Transnational Pilot 2 confirm its central role in advancing JETforCE's objectives of supporting a just and sustainable energy transition in Central Europe. Across both Stage 1 and Stage 2, the pilot demonstrated the value of the Technology Evaluation Tool as an innovative instrument for assessing economic, environmental, and social impacts of energy investments. Testing at local and regional levels, involving a wide range of stakeholders, not only validated the tool's relevance but also generated constructive feedback that is already guiding its refinement.

The analysis of previously implemented technologies (2017–2022) highlighted that both small-scale and large-scale projects can generate substantial benefits, with evaluation scores ranging from moderate to excellent. Successful cases combined technical efficiency with social inclusiveness, showing that modest investments in public buildings or schools can deliver meaningful community benefits alongside emission reductions. Phase 2 further demonstrated the flexibility of the tool in assessing new solutions to identified challenges, from community-based heating networks to innovative training programmes for the future energy workforce. These case studies underline the importance of aligning technological innovation with social equity and local engagement.

Monitoring and risk management processes ensured transparency and stability throughout implementation, while the Monitoring Committee provided valuable direction, helping partners improve the tool and strengthen the quality of results. Feedback from partners consistently pointed to areas where usability, clarity of results, and user experience can be enhanced, leading to concrete recommendations for future development.

Overall, Transnational Pilot 2 has successfully laid the groundwork for improving digital evaluation methods and validating just transition technologies. By combining technical performance with socio-economic considerations, the pilot contributes to more informed decision-making, greater stakeholder involvement, and a stronger alignment of regional investments with EU climate and energy goals. Moving forward, continuous improvement of the tool, deeper community engagement, and enhanced guidance for users will be key to maximising its long-term impact and ensuring that the energy transition in Central Europe is both sustainable and inclusive.