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ECODISCOVERY

"Play And Discover The Future"



PROJECT RESULT 3 • COORDINATOR COMPILATION

Training & Workshop Materials

Project Result 3 – A Handbook for Creating Environmental Educational Games

Project: EcoDiscovery – Play And Discover The Future

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Introduction

About EcoDiscovery

EcoDiscovery – *Play And Discover The Future* is an Erasmus+ KA210 small-scale school partnership between organisations in Türkiye, the Czech Republic and France. Its central output is ECOTOPIA, an educational game that raises environmental awareness through game-based learning.

Purpose of this handbook

This handbook (Project Result 3) compiles the training content and reusable materials produced during the project's three Learning, Teaching and Training (LTT) activities. It is a practical reference for teachers and educators who wish to replicate the workshops and methodology used to design the ECOTOPIA game. It brings together three parts: the Training Modules, the Workshop Templates and the Classroom Activities.

Target groups

- Teachers of science, geography, citizenship, ICT, art and English (CLIL).
- Educators and NGO facilitators running game-based or project-based learning.
- Learners aged 10–14 taking part as designers and testers.

Relation with the ECOTOPIA game

Every module, workshop and activity in this handbook connects directly to the ECOTOPIA game and its four environmental themes – water, energy, biodiversity and waste. The methodology described here is the same one used by the project partners to create the game and can be reused to design new educational games or to teach environmental topics through play.

How to use this handbook

Use the Training Modules to understand the full design process, the Workshop Templates to run ready-made sessions, and the Classroom Activities to extend learning into hands-on, real-world tasks. Each part can be used on its own or as a sequence.

About This Handbook

This handbook compiles the training content delivered during the three Learning, Teaching and Training (LTT) activities of the EcoDiscovery project. It is a practical reference for teachers and educators who wish to replicate the workshops and methodology used to create the ECOTOPIA educational game. The three modules follow the project journey and are designed so that each builds on the previous one.

The Four Themes of ECOTOPIA

Each theme becomes a chapter of interactive, mission-based learning

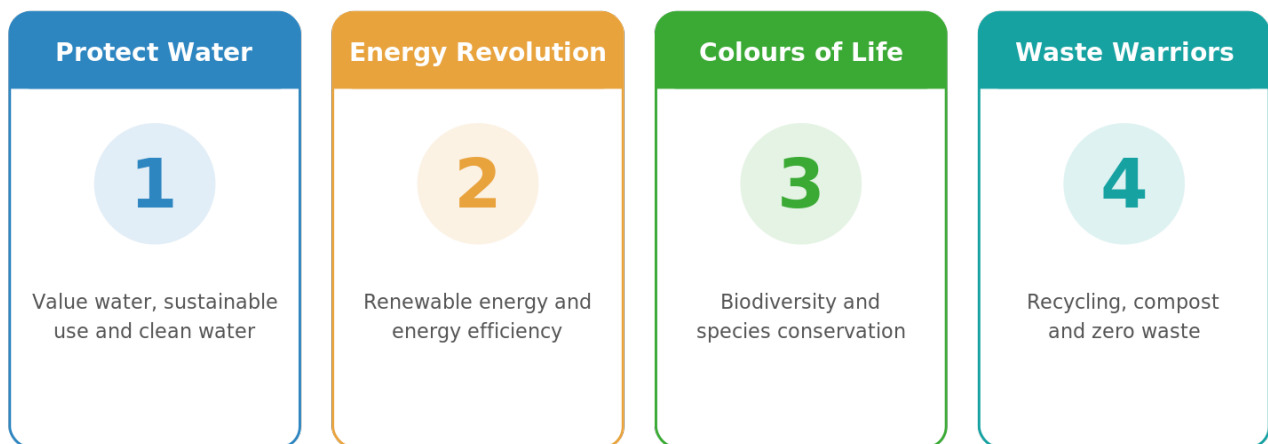


Figure 1. ECOTOPIA turns four environmental themes into four playable chapters.

ECOTOPIA is a scenario-based, mission-oriented game for learners aged 10–14, built in Unity and available on web, Android, APK and Windows in four languages. Players join an Eco-Team and solve real problems across water, energy, biodiversity and waste, supported by information cards, a scoring system and an in-game AI assistant.

Target groups

- Teachers of science, geography, citizenship, ICT, art and English (CLIL).
- Educators and NGO facilitators running game-based or project-based learning.
- Learners aged 10–14 taking part as designers and testers.

The Three LTT Activities

Each mobility built on the outputs of the previous one



Figure 2. The three LTT activities, each building on the outputs of the previous one.

Module 1 corresponds to LTT-1 (Balıkesir, Türkiye), Module 2 to LTT-2 (Varnsdorf, Czechia) and Module 3 to LTT-3 (Paris, France).

Methodological Framework

The training is built on five connected principles. Together they turn environmental content into an active, creative and collaborative experience rather than passive information transfer.

Methodological Framework

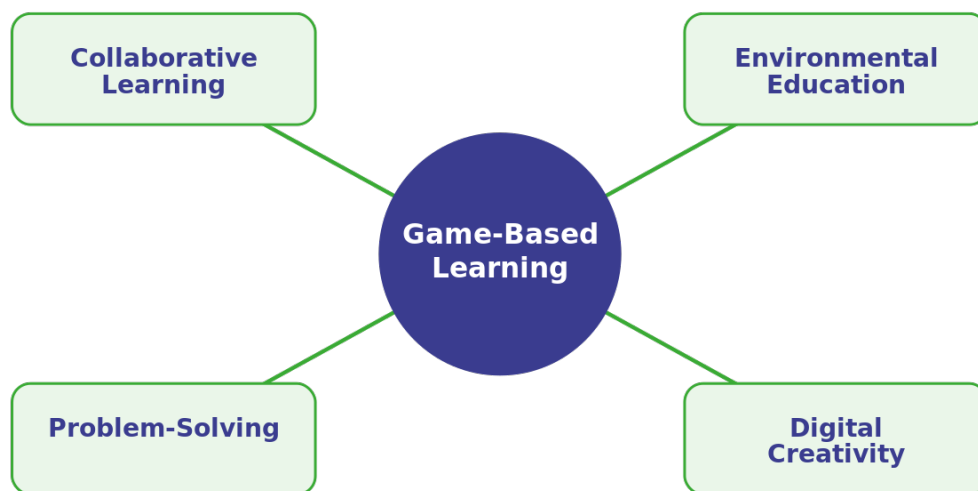


Figure 3. Game-based learning at the centre of the ECOTOPIA methodology.

Game-based learning

Learners build knowledge by designing and playing games. Environmental content is embedded in missions, choices and feedback so concepts are experienced rather than only memorised. Immediate feedback – information cards for weak choices and data for good ones – is a core mechanism.

Collaborative learning

Mixed-ability, and where possible mixed-nationality, teams work together. Peer support and shared ownership drive motivation, as demonstrated across the three EcoDiscovery mobilities where cultural diversity became a genuine creative asset.

Environmental education

Every activity connects to real environmental systems – water, energy, biodiversity and waste – and to concrete actions learners can take in daily life, closing the gap between knowledge and behaviour.

Problem-solving

Participants identify a problem, weigh options and design a solution, developing critical thinking. Missions place learners in decision-making roles and show the consequences of their choices.

Digital creativity

Learners express ideas through digital tools such as the Unity game engine, building digital literacy, visual thinking and confidence with technology.

The Design Process

Across the three modules, the game was developed within a spiral educational game-design model. The four phases are not independent: each builds on the outputs of the previous one and the cycle repeats as the product improves.

Spiral Educational Game Design Model

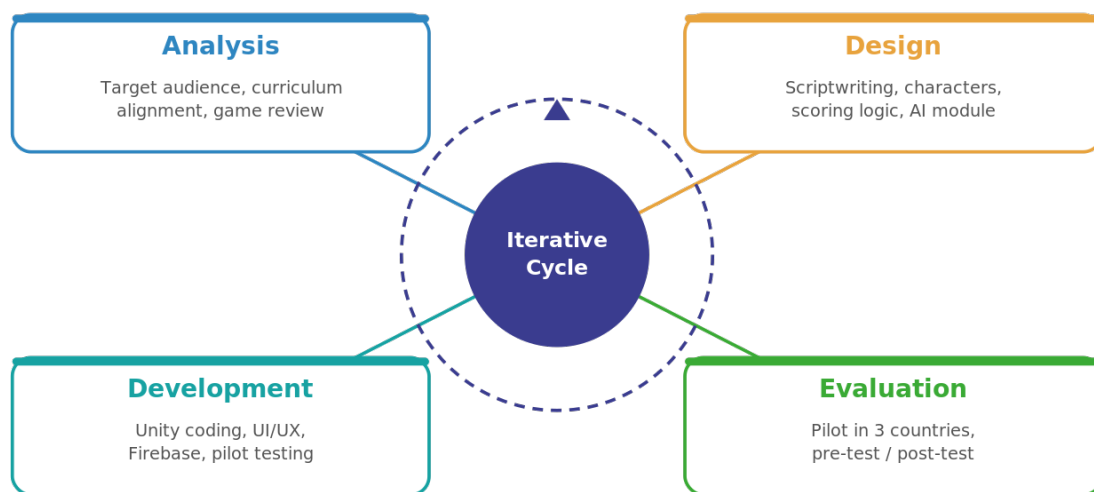


Figure 4. The spiral model: analysis, design, development and evaluation, repeated iteratively.

Every mission the learners design follows the same micro-cycle, mirroring the game's own feedback loop and reinforcing the method at task level.

How Every Mission Works

A repeating cycle that turns play into learning and action



Figure 5. The five-step mission cycle used throughout ECOTOPIA.

Module 1 | Idea Development & Script Design

Module 1 builds the creative and conceptual foundation of an environmental game. It corresponds to LTT-1 and turns environmental problems into stories, characters and missions. It works well as a one-day workshop or a series of shorter sessions.

1. Environmental problem identification

Participants explore an environmental theme (water, energy, biodiversity or waste), research real problems and choose one to address through a game. Reviewing existing sustainability games (for example SimCity, Eco, Terra Nil) helps anchor abstract concepts in playable ideas and reveals gaps to improve on.

2. Story development

Teams create a simple narrative: a setting, a challenge and a goal. In ECOTOPIA this is the story of an ordinary student who notices small problems – a dripping tap, lights left on, litter, a polluted pond – and becomes an Eco-Team hero by solving them.

3. Character creation

Participants design a hero and supporting characters that embody the environmental message, giving the player someone to identify with and a reason to care.

4. Mission design

Each story is broken into short missions with a clear task, interactive steps, information cards and a real-life action. Missions balance challenge, learning and fun, and follow the five-step cycle in Figure 5.

5. Group work & feedback

Teams present their concepts and give structured peer feedback, refining ideas collaboratively before moving to visual design. Archiving these concepts feeds directly into Module 2.

Learning outcomes – by the end, participants can:

- identify an environmental problem suitable for a game
- develop a story, characters and missions around it
- embed accurate environmental facts in gameplay
- give and receive constructive creative feedback

Module 2 | Visual Design & Game Mechanics

Module 2 translates ideas into visual and interactive assets. It corresponds to LTT-2 and focuses on how a game looks and how it plays.

1. Visual design principles

Participants learn about colour, contrast, layout and theme, using visual language to reflect environmental ideas – for example, colour palettes that express the climate crisis.

2. Child-friendly interfaces

Interfaces are kept clear and accessible for ages 10–14: large buttons, simple icons, readable text and helpful feedback for every action.

3. Basic game mechanics

Teams implement core mechanics – movement, clicking, dragging, sorting and choices – and connect them to scoring, stars and badges that motivate different player types (achievers, explorers and social players).

4. Prototype development

Using the Unity engine, participants build a playable prototype of one or two missions, integrating visuals with mechanics.

5. Testing

Prototypes are tested within the group; observations guide quick improvements to clarity, difficulty and engagement.

Learning outcomes – by the end, participants can:

- apply basic visual design principles to a game
- design a clear, child-friendly interface
- implement core mechanics in a prototype
- test and improve a prototype based on feedback

Module 3 | Game Development & Launch

Module 3 completes the game and prepares it for players. It corresponds to LTT-3 and covers finishing, testing, publishing and sharing.

1. Final development

Teams integrate all mission sections into one build, add final polish and fix bugs to make the game launch-ready across web, Android and Windows.

2. User testing

The game is tested with real learners. Structured observation and simple tasks reveal where players succeed, struggle or lose interest.

3. Feedback collection

Feedback is gathered through short forms and discussion, then prioritised and integrated into the final build.

4. Publishing

The game is prepared for release in web, Android (Google Play and APK) and Windows versions, with clear access information for schools and families.

5. Dissemination

Teams plan how to share the game – the project website, social media, school events and partner networks – so it reaches as many learners as possible.

Learning outcomes – by the end, participants can:



- finalise and debug a complete game build
- run structured user testing and integrate feedback
- prepare a game for web, mobile and desktop publishing
- plan and carry out a dissemination campaign

These three reusable workshop plans let teachers and facilitators recreate the core of the EcoDiscovery training in their own classrooms. Each plan lists clear objectives, timing, materials, step-by-step instructions and reflection questions. They can be run as a series or as standalone sessions.

Workshop 1 | Creating an Environmental Game Idea

Objectives

- Identify a real environmental problem worth solving.
- Turn it into a simple game story with a hero and a goal.
- Work collaboratively and pitch an idea to peers.

Duration	60–90 minutes	Group size	Teams of 3–4
Age	10–14	Materials	Paper, pens, sticky notes; optional computers/tablets

Steps

- **Warm-up (10 min).** Brainstorm environmental problems learners notice at home and school.
- **Choose a theme (10 min).** Each team picks one theme: water, energy, biodiversity or waste.
- **Research (15 min).** Teams find 3–4 key facts about their problem.
- **Design the idea (20 min).** Teams create a hero, a setting and a goal, and sketch one mission.
- **Pitch (15 min).** Each team presents its idea; others give one strength and one suggestion.
- **Refine (10 min).** Teams improve their idea using the feedback.

Reflection

- Which environmental problem did we choose, and why?
- How does our game make the player care about it?
- What did another team suggest that we could add?

Workshop 2 | Designing a Game Mission

Objectives

- Break a game idea into a clear, playable mission.
- Embed accurate environmental facts as information cards.
- Balance challenge, learning and a real-life action.

Duration	60–90 minutes	Group size	Teams of 3–4
Age	10–14	Materials	Mission template sheet, pens; optional prototyping tools

Steps

- **Recap (5 min).** Revisit the team's game idea and hero.
- **Define the task (10 min).** Write one clear player goal for the mission.
- **Design the steps (20 min).** List 3–5 interactive steps (click, drag, choose, repair).
- **Write information cards (15 min).** Add a factual card for key correct and incorrect choices.
- **Add reward & real-life card (10 min).** Decide the badge and the real-life action.
- **Peer test (20 min).** Swap missions with another team and give feedback on clarity and fun.

Reflection

- Is the player goal clear in one sentence?
- Are our facts accurate and easy to understand?
- What real-life action does the mission encourage?

Workshop 3 | Testing and Improving ECOTOPIA

Objectives

- Play-test the ECOTOPIA game (or a team prototype) systematically.
- Collect structured feedback from real users.
- Prioritise and plan improvements.

Duration	45–60 minutes	Group size	Pairs + whole class
Age	10–14	Materials	Computers/tablets, feedback forms, pens

Steps

- **Set the focus (5 min).** Agree what to observe: clarity, difficulty, fun, learning.
- **Play-test (20 min).** Pairs play a chapter while noting where they hesitate or get stuck.
- **Collect feedback (10 min).** Learners complete a short feedback form (see Evaluation Forms).
- **Share findings (10 min).** Groups report the top issue and one thing that worked well.
- **Plan improvements (10 min).** Rank changes as "must fix", "nice to have" and "later".

Reflection

- What was the most common difficulty testers faced?
- Which information cards helped players most?
- What is the single most important improvement to make next?

These four ready-to-use classroom activities extend the ECOTOPIA game into hands-on, real-world learning. Each links to a game section and can be run in a single lesson with simple materials. They suit ages 10–14 and can be adapted for different subjects. Every activity lists its objective, materials, curriculum links, steps, learning objectives and a differentiation idea.

The Four Themes of ECOTOPIA

Each theme becomes a chapter of interactive, mission-based learning

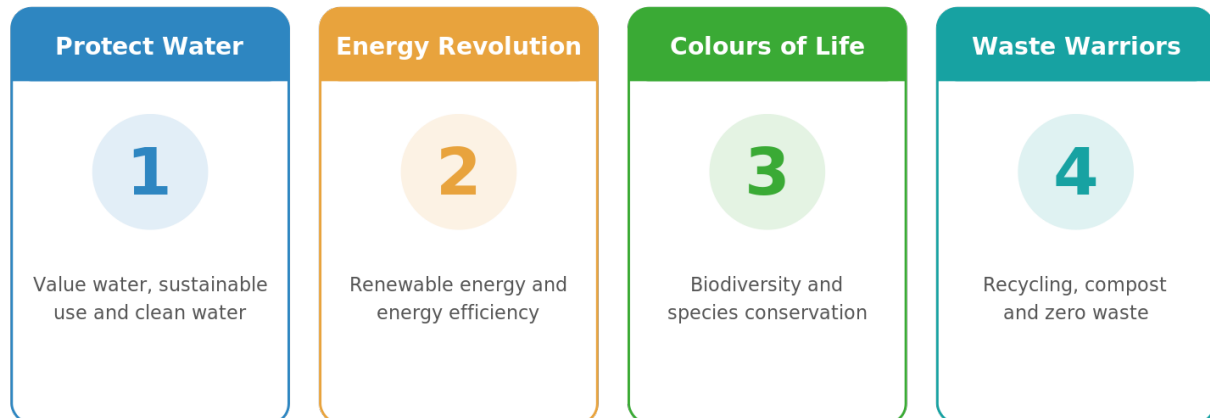


Figure 1. Each activity connects to one of the four game sections.

Activity 1 Water Saving Challenge

Section 1 • Protect Water

Objective	Learners identify and reduce water waste at school and home, connecting daily habits to measurable savings.
Duration	One lesson (45 min) + a week-long home challenge
Materials	Water audit checklist, pens; optional stopwatch and measuring jug
Curriculum	Science (water cycle, measurement); Citizenship (responsibility)

Steps

- Discuss where water is used and wasted; predict the biggest wasters.
- In pairs, complete a water audit of the classroom or a home area using the checklist.
- Calculate simple savings (for example, minutes saved in the shower).
- Each learner commits to one water-saving action for a week and records progress.
- Share results in the next lesson and celebrate the biggest savers.

Learning objectives

- Explain why fresh water is a limited resource.
- Identify personal habits that waste or save water.
- Estimate savings from a simple behaviour change.

Differentiation. Younger learners audit one tap; older learners estimate weekly litres saved and present the data.

Link with ECOTOPIA. Follows Section 1, where players find hidden water waste and fix it. **Extension:** Create a class poster of the top five water-saving tips.



Activity 2 Energy Detective

Section 2 • Energy Revolution

Objective	Learners audit energy use, spot waste and propose efficient or renewable solutions.
Duration	One lesson (45–60 min)
Materials	School map or floor plan, clipboards, pens; optional plug-in power meter
Curriculum	Science (energy sources, efficiency); Geography (sustainability)

Steps

- Introduce energy waste and “vampire” standby energy.
- Teams tour the school (or classroom) to map lights and devices left on.
- Mark waste points on the map and suggest a fix (switch off, LED, timer, solar).
- Teams present their map and the estimated impact of their fixes.
- Agree on one whole-class energy rule to adopt.

Learning objectives

- Distinguish renewable and non-renewable energy.
- Identify sources of energy waste in a building.
- Propose realistic efficiency or renewable solutions.

Differentiation. Provide a ready-made checklist for support; ask extension groups to rank fixes by cost and impact.

Link with ECOTOPIA. Follows Section 2, where players hunt energy leaks and install renewables. **Extension:** Track the class electricity habit for two weeks and compare.

Activity 3 Biodiversity Walk

Section 3 • Colours of Life

Objective	Learners observe and record local species to understand biodiversity and habitats.
Duration	One lesson (45–60 min), outdoors
Materials	Observation sheet, pencils; optional magnifiers, cameras, field guide
Curriculum	Science (ecosystems, classification); Art (nature sketching)

Steps

- Discuss what biodiversity is and why pollinators matter.
- Walk a safe route in the school grounds or a nearby park.
- Record species seen (plants, insects, birds) and where they were found.
- Back in class, group findings and discuss which habitats supported most life.
- Plan one action to boost local biodiversity (for example, a pollinator patch).

Learning objectives

- Recognise a range of local species and their habitats.
- Explain the role of pollinators in the ecosystem.
- Suggest a practical way to support local biodiversity.

Differentiation. Give picture ID cards for support; ask extension learners to group species by type or habitat.

Link with ECOTOPIA. Follows Section 3, where players document species and design a pollinator park.
Extension: Build an insect hotel or plant pollinator-friendly flowers.

Activity 4 Zero Waste Classroom

Section 4 • Waste Warriors

Objective	Learners reduce, reuse, sort and compost to move the classroom towards zero waste.
Duration	One lesson (45 min) + ongoing routine
Materials	Sorting bins/boxes, labels, gloves; optional scales and a compost caddy
Curriculum	Science (materials, decomposition); Citizenship (community action)

Steps

- Audit one day's classroom waste and sort it into categories.
- Discuss which items could be reduced, reused, recycled or composted.
- Set up labelled sorting stations and a simple compost caddy.
- Assign weekly monitor roles to keep the system running.
- Weigh or count waste weekly and set a reduction target.

Learning objectives

- Classify common waste and its correct disposal route.
- Explain the benefits of composting and recycling.
- Design a simple system to reduce classroom waste.

Differentiation. Support learners sort with picture labels; extension groups design a whole-school waste plan.

***Link with ECOTOPIA.** Follows Section 4, where players sort waste, compost and design a zero-waste home.
Extension: Run a "waste-free lunch" day and measure the difference.*

Activities at a Glance

Activity	Section	Setting	Key outcome
Water Saving Challenge	1 – Water	Class + home	Reduce personal water waste
Energy Detective	2 – Energy	School	Spot and fix energy waste
Biodiversity Walk	3 – Nature	Outdoors	Observe and support species
Zero Waste Classroom	4 – Waste	Class routine	Cut and sort classroom waste

This section provides ready-to-use tools for assessing learning during and after the training. They complement the game's built-in scoring and can be photocopied. Three tools are included: an observation checklist, a group feedback form and a product-evaluation rubric.

Observation Checklist

For facilitators to complete while observing a workshop or game session. Rate how far each behaviour is observed (1 = not observed, 2 = emerging, 3 = evident, 4 = strong).

Criterion	1	2	3	4
Learners engage with the tasks and information cards.				
Learners connect choices to real environmental ideas.				
Learners collaborate and support one another.				
Learners use relevant environmental vocabulary.				
Learners propose realistic real-life actions.				
Learners reflect critically on the solutions.				

Notes:

Group Feedback Form

For a team to complete together at the end of a session.

What worked well for our team

What we found difficult

One thing we will improve or do next

Product Evaluation Rubric

For assessing the quality of a game idea, mission or prototype produced during the training. Circle or mark the level that best fits each criterion.

Criterion	Emerging	Developing	Secure	Strong
Environmental accuracy – facts are correct and relevant.				
Narrative coherence – story, characters and goal fit together.				
Learning value – the task teaches a clear environmental idea.				
Playability – steps are clear, fair and engaging.				
Real-life link – encourages a concrete action.				
Presentation – visuals and communication are clear.				

Overall comments and next steps:

The annexes provide reusable worksheets, useful links and quick-access QR codes to support the training and the wider dissemination of ECOTOPIA.

Annex I | Worksheet: Environmental Game Idea Canvas

Use this canvas in Workshop 1 to capture a team's game idea on a single page.

Team / names:

Environmental theme:

Problem we address:

Our story (setting, challenge, goal):

Our hero / characters:

Key facts to include (2–4):

One real-life action:

Annex II | Worksheet: Mission Design Sheet

Use this sheet in Workshop 2 to turn an idea into one playable mission.

Mission title:

Player goal (one sentence):

Interactive steps (3–5):

Information cards (fact for a right / wrong choice):

Reward / badge:

Real-life action card:

Annex III | Useful Links

Resource	Link
Project website	https://ecodiscovery.eu
Play the game (web)	https://game.ecodiscovery.eu
Android (Google Play)	play.google.com/store/apps/details?id=com.ecodiscovery.app
Android (APK)	https://ecodiscovery.eu/releases/Ekotopia.apk
Windows version	https://ecodiscovery.eu/releases/Ekotopia.rar
Creative Commons licence	https://creativecommons.org/licenses/by-nc-sa/4.0/

Annex IV | QR Codes

Scan to reach the game and project resources directly.



Play (web)
game.ecodiscovery.eu



Google Play
ECOTOPIA app



Project site
ecodiscovery.eu

Annex V | Photographs

A photographic record of the three LTT activities – workshops, group work, cultural excursions and certificate ceremonies – is maintained in the project archive and on the project website. All photographs were taken with participant consent for dissemination and reporting purposes.