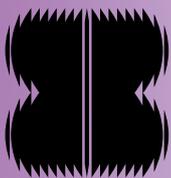




Project Butterfly

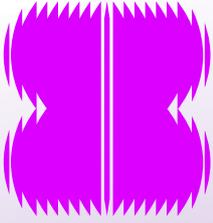


Project Butterfly

Boosting the environmental
awareness in opera creation



Co-funded by
the European Union



Boosting the environmental awareness in opera creation



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The opera première in Modena (April 2025)

Project Butterfly proves that opera can soar sustainably. By rethinking travel, reusing materials, and pioneering remote rehearsals, the production cut its carbon footprint from 56 tonnes to just 23 tonnes of CO₂. More than numbers, it showed how art, ecology, and youth voices can unite to create powerful, relevant opera. A model for transformation, it invites the performing arts to embrace sustainability as a source of creativity and renewal.



Opera is one of the most precious treasures of European cultural history, a heritage that has united audiences across Europe while keeping its linguistic diversity alive. Born from the allegorical celebrations and splendour of 17th-century European courts, environmental sustainability was certainly not among its priorities. In fact, entire theatres were sometimes built for a single performance in the early days of opera. Since then, opera houses around the world have evolved into modern machines with advanced technologies, combining beauty, efficiency, and tradition. Today, they are taking the next step to become increasingly environmentally sustainable and, in some cases, to share with audiences the awareness needed to live well and act on climate change and social justice.

Inspired by the idea that the flap of a butterfly's wings can change the world, **Project Butterfly** was created to retrace every phase of opera creation and production, experimenting with sustainable best practices and engaging with a theatrical system that, through the Opera Europa network, connects more than two hundred theatres across the continent. Led by the Teatro Comunale di Modena, **the project won the 2023 Creative Europe call for international cooperation**, with a partnership including Opera Box in Helsinki, Baltic Opera in Gdańsk, the environmental agency AESS in Modena, the German agency Heimspiel specialising in virtual reality and artificial intelligence, and the Brussels-based European communication agency GOPA Com.

European Cooperation for a Sustainable Opera

European Cooperation for a Sustainable Opera

Students during
the co-creation of the opera plots

The new opera consists of three 30-minute acts, one from each partner country, with stories dedicated to an environmental theme: water, earth, and air. The three short operas were commissioned from composers and librettists from Italy, Poland, and Finland. Based on the principle that sustainability means first and foremost preserving resources for future generations – and inspired by the Fridays for Future movement – the initiative invited high school students to provide the main creative stimulus for the artistic project and the reflection on sustainability.

The opera's concept and libretto began with a co-creation phase involving high school students from the three participating cities – Modena, Gdańsk, and Helsinki – through two cycles of workshops: the first moderated by the environmental agencies coordinated by AESS, and the second by the opera's three librettists. Sixteen-year-old students from Otaniemen Lukio in Helsinki, High School No. 6 in Gdańsk, and Francesco Selmi in Modena actively participated in the project: they cast decisive votes to select the composers, wrote the storylines for the three one-act operas, engaged with the authors and theatre directors, and exchanged ideas through online meetings.



The path taken toward environmental sustainability left a lasting mark on the awareness of the theatre teams involved in the project and led to useful solutions and tools for the future of the sector. The opera's set design, made of wood and fabric, was conceived using recycled materials and scaled down so that each theatre could recreate the same structure locally without the need for transportation. A key scenic element was created using digital images generated by Heimspiel through artificial intelligence. To measure the actual environmental impact and identify effective solutions, the Teatro Comunale di Modena – where the opera production originated – adopted a CO₂ measurement

tool developed by the UK-based sustainability leader for the cultural sector **Julie's Bicycle** (**The Creative Climate Tools**).

The first musical rehearsals, involving performers and composers, were conducted remotely using **LoLa (low latency)**, an audio-video connection developed by the **GARR university network** and the Trieste Conservatory. Audiences were offered

the **Bike to Theatre app**, a system that rewards those who travel to the theatre on foot or by bicycle, developed by the agency **WeCity**, and an artificial intelligence avatar that interacts in real time, answering questions about opera, sustainability, and the project itself, through a prototype developed by the German startup **Conversational Artificial Intelligence**.

Project meeting in Gdańsk (May 2024)



The Opera Houses

The collaboration between three European theatres formed the cornerstone of the sustainable opera production created through Project Butterfly. These theatres are diverse in nature and geographically distant across Europe. The cultural diversity between the three theatres and the three countries involved made the project even more stimulating – both in terms of the collaboration among the theatre teams and the relationships formed among the students from the three participating countries.



Teatro Comunale di Modena,
Luciano Pavarotti statue

TEATRO COMUNALE PAVAROTTI-FRENI DI MODENA

The Teatro Comunale di Modena, built “for the decorum of the city and the transmission of the scenic arts”, was officially opened in 1841. It is one of the most prestigious Italian theatres, renowned for its architectural conformity to the traditional “sala all’italiana”, which has retained its original elegance and refinement, as well as for its rich annual programme. The season includes opera, ballet and concerts every year. Despite its long and rich history, the Teatro Comunale di Modena is a place where tradition and modernity converge. It focuses on the artistic and cultural exchange of ideas and languages. Its programme presents masterpieces from the opera and ballet repertoire along with modern and contemporary shows that offer new ways of performing and experiencing theatre.

The theatre was renamed Teatro Comunale Pavarotti-Freni in honour of the great Modenese opera singers Luciano Pavarotti and Mirella Freni. Beneath its portico stands a life-size statue of tenor Luciano Pavarotti, depicted smiling with outstretched arms and a foulard in his left hand, in his characteristic gesture of greeting the public after a performance. The Teatro Comunale di Modena is also committed to nurturing new generations by organising performances for schools and offering highly specialised training courses for opera singers.



Teatro Comunale di Modena, main hall

The Opera Houses

OPERA BOX

Founded in 2016, Opera Box is an opera company whose first production, Richard Strauss's *Ariadne auf Naxos*, received wide acclaim. Since then, the company has steadily expanded its repertoire, gradually establishing itself as Helsinki's second opera stage. It is based in the city's oldest opera house, the Alexander Theatre.

Opera Box seeks to enrich and develop the Finnish opera scene by producing both its own and guest performances. Wherever possible, productions include opera and operetta in the domestic language, reflecting a strong connection to Finnish tradition, while also opening the stage to new artists and fresh collaborations.

Opera Box's repertoire includes classic operas from the German, Italian, British and French traditions, but one of its key activities is commissioning contemporary operas. The company is also active in producing shows for children.



Opera Box is based at the Alexander Theatre, located on Bulevardi in central Helsinki. Inaugurated in 1880 and named after Tsar Alexander II of Russia, the theatre was originally built for Helsinki's Russian-speaking population. It was designed by Colonel Pyotr Benard and richly decorated by artists from Saint Petersburg and Finland. From 1918 to 1993, it



Alexander Theatre, Helsinki

housed the Finnish National Opera and Ballet. After their relocation, the theatre resumed its original name and became a vibrant venue for guest performances.

Today, the Alexander Theatre hosts a wide range of cultural events, including opera, dance, concerts, musicals, and family shows. It also

offers rehearsal spaces, dance studios, and offices for creative companies. With its blend of historical charm and modern programming, the theatre remains a cornerstone of Helsinki's cultural life and a hub for both Finnish and international productions.



The Opera Houses



Baltic Opera, Gdańsk

OPERA BALTYCKA

Based in Gdańsk, Poland, the Baltic Opera is one of the most important cultural institutions in the Pomerania region. Its work brings together musicians, singers, dancers, and both artistic and technical staff. Since 1950, its activities have been housed in a modern building originally constructed as a sports and entertainment hall and later adapted for theatre use.

The Baltic Opera's mission is to share culture and open the world of music and opera to all. To bring audiences closer to the theatre, it offers a varied programme that ranges from classical operas to contemporary productions, complemented by a rich season of ballet performances. The institution also organises numerous educational activities and creative workshops for all ages, particularly children, including a regular Opera Children's Choir and dance classes.

Each summer, the Baltic Opera stages the Baltic Opera Festival, an international event featuring leading soloists, conductors, and performers from Poland and abroad. The festival takes place across the Tricity area, with many performances held at the unique Forest Opera in the nearby resort city of Sopot.



A three-act Opera for the Future of the Planet: Water, Air, Earth



Opera poster for the world premiere in Modena

OPERA CREDITS

Beniamin Baczewski **JEZIORO POPIOŁÓW**

(Lake of Ashes)

One-act opera based on a story developed
by students from High School No. 6 in Gdańsk
(Poland)

Libretto by Jagoda Jagson

Paavo Korpijaakko **HENGITA**

(Breathe)

One-act opera based on a story developed
by students from Otaniemen Lukio Upper
Secondary School in Espoo (Finland)

Libretto by Mirva Koivukangas

Marco Attura **PERLA DI SPERANZA**

(Pearl of Hope)

One-act opera based on a story developed
by students from F. Selmi Upper Secondary School
in Modena (Italy)

Libretto by Vincenzo De Vivo



The opera team after
the last performance
at the Baltic Opera.

CAST

Jezioro Popiołów (Lake of Ashes)

Salacja – Johanna Takalo
(cover and chorus: Giada Campione)
Elpida – Anna Capiluppi
(cover and chorus: Gohar Faradzian)
Anatol – Elena Antonini (cover and chorus:
Dominika Isabell Marková)
Foltyn – Łukasz Kózka
(cover and chorus: Petteri Loukio)
Protazy – Olli Tikkanen
(cover and chorus: Maciej Mielewczyk)
Charon – Karol Skwara
(cover and chorus: Maciej Mielewczyk)

Hengitä (Breathe)

Ilma / Air – Anna Capiluppi
(cover: Gohar Faradzian)
Jää / Ice – Johanna Takalo
(cover: Giada Campione)
Factory Owner's Assistant – Łukasz Kózka
(cover: Petteri Loukio)
Factory Owner – Olli Tikkanen (cover: Maciej
Mielewczyk)
Luonto / Nature – Elena Antonini (cover:
Dominika Isabell Marková)
Vesi / Water – Karol Skwara (cover: Maciej
Mielewczyk)

Perla di Speranza (Pearl of Hope)

Pearl – Anna Capiluppi
(cover: Gohar Faradzian)
Gemma – Johanna Takalo
(cover: Giada Campione)
Leonardo – Łukasz Kózka
(cover: Petteri Loukio)
Luca / a passer-by – Olli Tikkanen
(cover: Maciej Mielewczyk)
Dr. Li – Elena Antonini
(cover: Dominika Isabell Marková)
Zao – Karol Skwara (cover: Maciej Mielewczyk)

CREATIVE TEAM

Conductor – Jaan Ots
Stage Director – Matteo Mazzoni
Set and Costume Design – Joanna Borkowska
Assistant Set and Costume Designer –
Erica Natali
Video – Heimspiel
Video Direction Assistant – Luca Attilii
Lighting Design – Lauri Sirén

A co-production by

Fondazione Teatro Comunale di Modena
Opera Bałtycka in Gdańsk
Opera BOX in Helsinki
New staging

MUSIC ENSEMBLE

B.u.t.e.r.f.l.y. Project Ensemble

Violins

Klaus-Peter Haav, Amanda Ernesaks

Viola

Terhi Lehtiniemi

Cello

Iida-Vilhelmiina Sinivalo

Double Bass

Karol Lecybil

Flutes (also piccolo)

Filippo Mazzoli

Oboe (also English horn)

Kinga Bezpalko

Clarinets (also bass clarinet and alto saxophone)

Mariusz Jeka

Horn

Magdalena Milton

Percussion

Diego Basile, Gianmarco Petrucci

Piano and Keyboards

Marco Attura

A three-act Opera for the Future of the Planet: Water, Air, Earth

A three-act Opera for the Future of the Planet: Water, Air, Earth



Opera stage rehearsals in Modena



Technical rehearsals in Modena leading up to the première

PRODUCTION AND TOURING SCHEDULE

28–28 February 2025

The opera production began with three days of remote rehearsals involving the ensemble musicians, singers, conductor, and composers. These rehearsals were conducted using LoLa, an experimental audiovisual system that enabled remote music rehearsals without requiring participants to travel, thereby reducing the carbon footprint.

23 March – 8 April 2025

Musical and stage rehearsals took place in Modena, leading up to the dress rehearsal for schools and the final performances of the opera. On 23 March, with the arrival of the vocal cast, in-person rehearsals officially began at the Teatro Comunale di Modena and continued until 5 April. All the opera singers gathered in the rehearsal rooms along with the stage director, set and costume designer, conductor, staff from the three partner theatres, and the artistic directors.

From 6 April, the instrumental ensemble joined the rehearsals with the singers

9 April 2025 ▶

Dress rehearsal open to schools.

11 and 13 April 2025

Two successful performances of the opera were held in Modena. On 13 April, the video recording of the production also took place. On the day of the première, a pre-concert talk was held featuring the three composers.

30 April 2025

All performers gathered at the Alexander Theatre in Helsinki for the opera rehearsal.

1 May 2025

Dress rehearsal held in Helsinki.

2 and 3 May 2025

Opera performances took place in Helsinki.

29 May 2025 ▶

All performers gathered at the Baltic Opera in Gdańsk for the opera rehearsal.

30 May 2025

Dress rehearsal held in Gdańsk.

31 May and 1 June 2025

Opera performances took place in Gdańsk.



Students attending the opera première



Make up room
at the Baltic Opera
in Gdańsk

A three-act Opera for the Future of the Planet: Water, Air, Earth



Opera director Matteo Mazzoni takes a bow at the end of the performance

PROJECT BUTTERFLY ON STAGE

By Matteo Mazzoni

Project Butterfly begins long before it reaches the stage. Its journey starts in schools – more precisely, with students from three countries (Poland, Finland, and Italy) who, working alongside professional librettists, first wrote the storylines and then developed the librettos. These were later transformed into music by three composers – one from each country – bringing the students' mini masterpieces to life. Even earlier, the project received strong backing from three leading theatres: Teatro Comunale di Modena, Opera Bałtycka in Gdańsk, and Opera BOX in Helsinki. These institutions joined forces with other organisations, such as the environmental agency AESS in Modena, the Heimspiel agency in Augsburg (specialising in virtual reality and artificial intelligence), and the Brussels-based communication agency GOPACom., to bring this ambitious project to life.

Taking on the responsibility of staging these operas – after all the work done by so many people – was undoubtedly a great honour for me and the entire creative team, but also a great responsibility, as it involved the dreams,

ideas, and expectations of our youth.

For all these reasons, our production could only be an opera that breaks traditional boundaries – an immersive experience that not only celebrates the beauty of music and stagecraft but also carries a powerful and timely ecological message, one that came directly from our young people: art as a tool for awareness and transformation, an invitation to the audience to reflect on our responsibility for the future of the Earth.

Indeed, every phase of the production was designed to minimise environmental impact, with particular attention to CO₂ emissions. The entire production process was analysed and optimised, starting with the choices related to set design and the materials used – all recycled and sustainable – avoiding waste and minimising the use of non-renewable resources.

Even the transport of artists and equipment was strategically planned to reduce distances and optimise consumption, avoiding unnecessary travel.

This project is, in truth, a sign of hope – a future that can still be created with awareness and creativity.

It is a multimedia experience that combines the emotional power of opera with cutting-edge technologies, creating an environment in which the audience feels personally involved. The entire theatre – not just the stage – becomes a dynamic space, with moving images, lights, and projections that envelop the spectators, immersing them fully in the world of the three operas.

THE LAKE OF ASHES - Poland

The Lake of Ashes tells the story of the struggle between good and evil, set on the shores of a once-flourishing, now devastated and sorrowful lake.

At the heart of the story is the tragic love between Salacia and Foltyn, two characters who represent the opposing forces of light and darkness. Around them move a series of characters: Protazy, the old guardian of the lake; Elpida, the rightful queen of the lake, overthrown by Foltyn after his descent into evil; Anatol, the noble warrior who chooses to help Salacia in her fight against darkness; and Charon, who guides both characters and audience through the opera's events.

The encounter between Love and Evil – mirroring the transformation of the lake from a source of life to a black, putrid void – also represents the connection between humanity and the surrounding natural world, a cause-and-effect relationship that goes beyond actions and touches the very essence of who we are.

Where there is Good and Light, the world has a future. But when Evil prevails, everything ends – even nature itself feels it and suffers.

BREATHE - Finland

In an abstract and stylised world, the elements of Earth, Air, Nature, Water, and Ice – once harmonized and balanced for centuries – come into contact with the modern, unscrupulous world represented by the Factory Owner and his Assistant. These two characters, the only humans in the story, bring to the stage not only the drama of our mortality but also the absurd and surreal side of the human condition – always desperately searching for something that ultimately leads to our downfall.

From this strange encounter begins the change: pollution and illness. In the end, only Water remains, which, like a great curtain, floods everything.

This imaginary, timeless dimension – the stillness of natural elements, constantly evolving yet cyclically eternal – told through a sophisticated musical architecture striving for the absolute, reminded me of classical theatre, Greek tragedy, and its deep connection to myth.

PEARL OF HOPE - Italy

Set in the present day, Pearl of Hope tells the story of Perla, a girl like many others – happy and carefree, yet somewhat inattentive to the important things in life, as is often the case when one is young.

Life, however, leads her to confront illness and, more importantly, to a newfound awareness – never too late – that drives her to help others, from the floods in Romagna to distant lands in the East.

The entire story unfolds with a fast-paced, almost cinematic rhythm, told through a more contemporary dramatic style compared to the previous two operas. Rapid scene changes follow one another in this colourful musical journey, in close connection between stage and orchestra, lights and video.

In the end, however, the most important question remains: Will Perla be saved? And above all, can the world still be saved? I believe our young people – the students from the three schools who created these stories – have made their thoughts on the matter very clear.



The three composers (seated) at work

A three-act Opera for the Future of the Planet: Water, Air, Earth

18

SETS AND COSTUMES FOR A SUSTAINABLE OPERA

By Joanna Borkowska

Sustainability was a guiding principle in my work as set and costume designer for this project. This production is the natural outcome of a growing awareness of the environmental impact of the performing arts that I have been developing over time, where I prioritised the integration of sustainable practices, ensuring that my creative vision aligned with responsible resource management.

One of the key aspects of my sustainable approach in recent years has been **the careful selection of materials**. I favoured the use of natural, recycled, and locally sourced materials to reduce the production's carbon footprint. This meant incorporating reclaimed wood, second-hand fabrics, and biodegradable alternatives. Instead of relying on newly manufactured props or structures, I actively sought discarded materials that could be given a second life. This not only reduced waste but also gave the set design a unique character, adding authenticity to each project.



PROTAZY

ELPIDA

CHARON

FOLTYN

In this production, a fundamental principle of my design was modularity, with a focus primarily on fabrics (such as 100% cotton and linen) and wooden elements already available in theatre workshops or reused from previous productions.

I designed scenic elements to be easily dismantled and reconfigured, so they could be reused in future productions or adapted for touring performances. This approach reduced the need to build new elements for each staging of the same show.

The same principles extended to costume design. I made a conscious effort to select natural and organic fabrics, avoiding synthetic materials that contribute to microplastic pollution. Whenever possible, I collaborated with local artisans and sustainable textile producers to create costumes with a lower environmental impact. Upcycling also played a key role: I used leftover materials from previous productions, as well as fabric scraps and remnants, deconstructing and reconstructing them to fit the new production. I also sourced costumes from second-hand shops, vintage markets, and online platforms like Vinted.

Sustainability in my work as a set designer went beyond materials – it also involved ethical production and logistics. I worked with teams that shared my commitment to fair labour practices and responsible sourcing. This meant prioritising suppliers and workshops that adhered to ethical labour standards, ensuring that all collaborators were treated fairly and compensated appropriately. Transportation was another area where I aimed to improve sustainability: most of the set structures and all costumes could be compactly packed or easily assembled on-site, reducing fuel consumption and shipping emissions. In international projects, I always prioritised collaboration with local builders and artisans to minimise transport needs and support regional economies.



Costume design
for The Lake of Ashes

A three-act Opera for the Future of the Planet: Water, Air, Earth

A three-act Opera for the Future of the Planet: Water, Air, Earth

LAKE OF ASHES

The **Lake of Ashes** set design revolves around a single transformative fabric as its central element. This fabric, with a 4-metre diameter opening at its centre, represents the Lake of Ashes – an enigmatic void symbolising destruction, renewal, and the tension between good and evil. The dynamic interplay of lights, projections, and fabric movement creates a poetic, submerged world that evolves throughout the performance.

The fabric, made of 100% cotton, covered the entire stage, with the central hole serving as a focal point. A mechanised pulley system allowed it to move fluidly, sway, and shift angles during the performance. Its movement mirrored the tension between chaos and harmony. The set was intentionally minimalistic, focusing attention on the fabric and its interaction with light. The stage floor, in matte grey with slightly reflective properties, enhanced the lighting and projection effects.

BREATHE

The **Breathe** episode develops a narrative around environmental destruction and the complex interaction between humanity and nature. At the centre of the set is a single transformative visual element: a cube made of 100% cotton fabric, measuring 3.8 x 3.8 x 3.8 meters. Positioned at the centre of the stage, this cube symbolises a block of ice, embodying the fragility and transience of nature in the face of human exploitation. The gradual melting of the cube during the performance poignantly represents environmental degradation, particularly the damage caused by a nearby factory.

The cotton fabric of the cube responded beautifully to light and projections, creating a sense of fragility. Its transformation throughout the performance – from a perfect geometric cube to a flat pool of water – traces the visual and emotional arc of the opera. The factory was represented minimally, through graphic projections on the stage backdrop. The black wings framing the stage gradually closed in, symbolising human dominance and the shrinking of natural space. This movement added a layer of tension and dramatic progression to the visuals. The set relied heavily on lighting: gradient lighting passed through the cotton fabric, reflecting changes in mood, time, and environmental conditions. Projections added depth, showing abstract images of melting ice, factory smoke, and the encroachment of man-made structures.

PEARL OF HOPE

This part of the performance not only tells a story of transformation but embodies its message through sustainable materials. The production uses recycled and repurposed materials sourced from the theatres hosting the performance. The central scenic element is a dynamic modular system of wooden squares, representing the protagonist's journey and inner transformation.

The squares were made from reclaimed wood, salvaged from old sets, furniture, or theatre storage. They were painted and treated with eco-friendly, non-toxic finishes. Varying in size, they created visual diversity while maintaining a cohesive aesthetic. Each square was designed to be easily rearranged, stacked, or suspended, allowing for smooth transitions between scenes. They represent the building blocks of Pearl's journey, transforming in shape, position, and function as the character evolves. Dynamic projections animated the wooden structures, alternating between abstract patterns, natural elements, and architectural details. Lighting followed Pearl's emotional and narrative path, shifting from excess to harmony: saturated tones for her early life, soft natural colours for her exploration of the planet, and crisp, regenerative light during moments of introspection and resolution.



Opera set for
Perla di Speranza



Trojmiasto
Kulttuuri-Toimitus
Music Paper

trojmiasto.pl

Kultura

KULTURA · TEATR

Powiew świeżości i młodości w Operze Bałtyckiej. Udana premiera ekologicznego projektu Butterfly

Magdalena Raczek
1 czerwca 2025, godz. 10:15

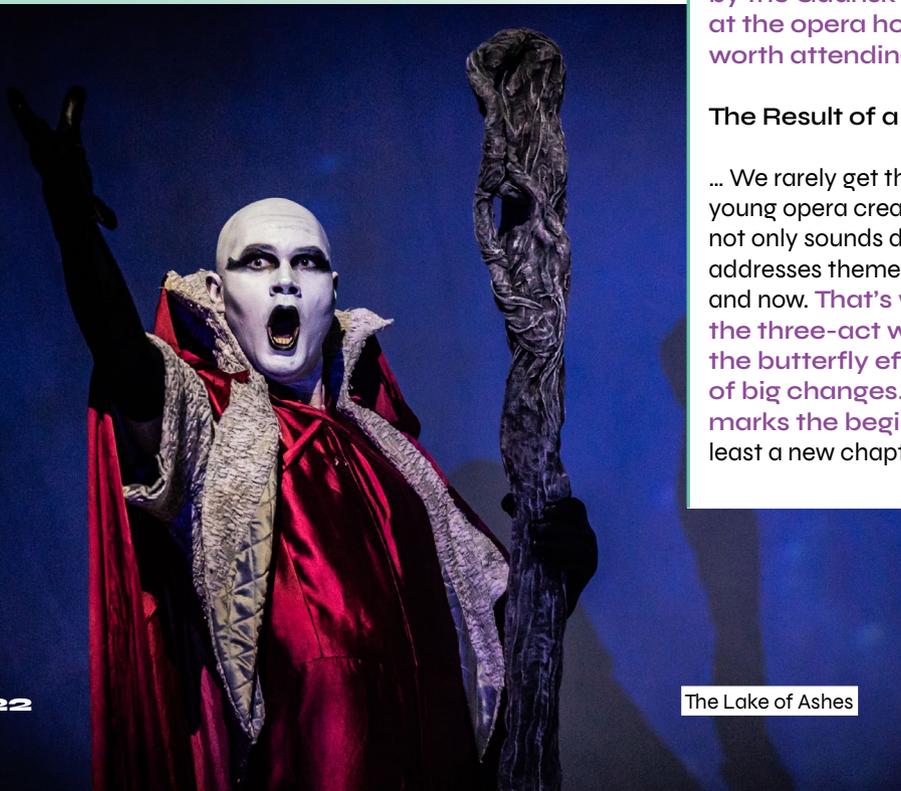
Najpierw w Modenie, potem w Helsinkach, a teraz nareszcie w Gdańsku, w *Operze Bałtyckiej* mogliśmy zobaczyć premierę *Perła di speranza (Perła Nadziei) / Hengitā (Oddychaj) / Jezioro popiołów*. To międzynarodowa, trzyaktowa opera powstała w ramach Projektu Butterfly - inicjatywy artystycznej łączącej muzykę operową z refleksją nad ekologią i przyszłością planety. Spektakl został przyjęty entuzjastycznie przez gdańską publiczność. Będzie go można obejrzeć [jeszcze dzisiaj](#) na deskach opery. Pozostały ostatnie wolne miejsca. Warto się wybrać.

«A breath of freshness and youth at the Baltic Opera. A successful premiere of the ecological Butterfly project.»

The performance was enthusiastically received by the Gdańsk audience. It can still be seen today at the opera house. Only a few seats remain. It's worth attending.

The Result of a Three-Year Project

... We rarely get the chance to experience works by young opera creators and contemporary opera that not only sounds different from classical pieces but also addresses themes that are close to us and relevant here and now. **That's why it's especially worth seeing the three-act work of Project Butterfly which, like the butterfly effect, could be the small beginning of big changes. I hope that's the case. I hope this marks the beginning of a new era in opera – or at least a new chapter in Gdańsk's operatic history...**





Pitääkö ooppera keksiä uudestaan? Project Butterfly taklasi ilmastoahdistusta kolmella kielellä

Anne Välinoro
17.05.25

«Does opera need to be reinvented? Project Butterfly tackled climate anxiety in three languages.»

... Does opera need to be reinvented? Yes. After all, it is one of the most expensive art forms. Digitalisation helps in many parts of the production process and reduces startup costs.

Opera-making can occasionally be crowdsourced, which in turn can help attract new generations of audiences. Young artists learn new languages, form teams with ease and, as a multinational group, immerse themselves in new challenges.

This entire production would rightfully deserve a place at events like the Helsinki Festival or the Savonlinna Opera Festival. Institutions are in need of exactly this kind of shake-up.

On a European level, it may be easier to secure funding for projects by young creators than by working within the confines of a single country. At the very least, it fosters a sense of community. I've always found it strange that a star singer can just slip into an opera house right before the premiere, perform their role, and remain disconnected from the rest of the team.

LA GRANDE MUSICA È ONLINE

MUSIC PAPER

SPETTACOLI

PARTE DA MODENA IL PROGETTO BUTTERFLY EUROPEO E SOSTENIBILE

da Francesco Arturo Saponaro | 19, Apr, 25

Modena, Teatro Comunale Pavarotti-Freni | *Progetto Butterfly: Baczewski The Lake of Ashes, Korpijaakko Hengita, Attura Perle di speranza*, | Mazzoni (reg.), Ots (dir.) | Takalo, Capiluppi, Antonini, Kózka, Tikkanen, Skwara

... A European Union call has awarded a groundbreaking proposal, Project Butterfly – the flutter of a butterfly can change the world... – which not only focused on environmental protection but also explored new sustainability practices in the creation and production of musical theatre.

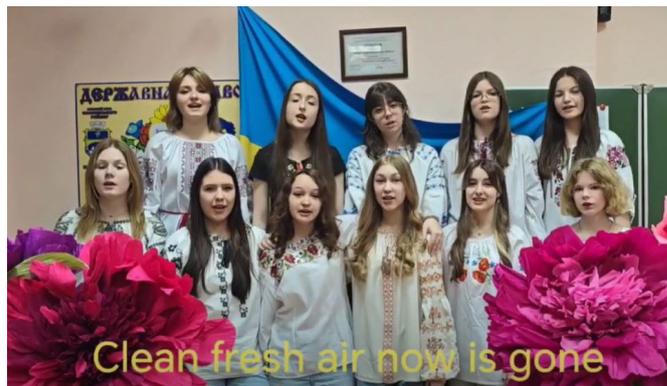
In short, this journey has undoubtedly left a mark on the understanding of new possibilities and horizons among the involved theatre groups. It has thus sown the seeds of interesting tools and perspectives for the future of this increasingly connected world; the network Opera Europa based in Brussels, for instance, connects over two hundred theatres across the continent.

The audience showed great enthusiasm, generously applauding, and the visible happiness of the young performers reflected their deep commitment. After the premiere in Modena, the triptych will continue its journey with scheduled performances in Helsinki on May 2 and 3, and in Gdańsk on May 31 and June 1...

Project Outputs

Student exchange meeting

Students from Modena, Gdańsk, and Helsinki met in two online sessions dedicated to collaborative work and exchange, during which they presented their projects. The meetings, which involved around sixty students, took place on Tuesday 14 May, from 10:00 to 11:30 am CET, and Tuesday 21 May, from 10:00 to 11:30 am CET. Students from School No. 16 in Kyiv with advanced English composed a beautiful song about sustainability and performed it for fellow students from Modena, Helsinki and Gdansk during the online video conversation. The meetings were coordinated by AESS.



Kyiv students sing a song dedicated to the project during an online meeting with students from Modena, Gdańsk, and Helsinki.

AESS Modena is the environmental agency that led the technical and scientific aspects related to environmental sustainability, including the training of students and the technical and artistic teams at the theatres.

Wecity is the company that developed the Bike to Theatre project, an app that tested incentives for sustainable mobility among the audience.



AESS headquarter in Modena



Bike to Theatre app



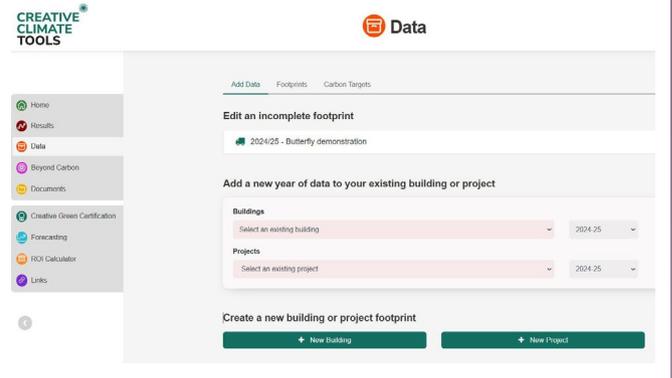
Giulia Donatelli holding her dissertation

Creative Climate Tools

The Creative Climate Tools (CC Tools) is the tool developed by the agency Julie's Bicycle that made it possible to measure the environmental impact of the project.

Giulia Donatelli is an environmental engineering student from the University of Modena and Reggio Emilia who wrote her master's thesis on Project Butterfly and the evaluation of its environmental impact.

Heimspiel agency, a project partner, and the company CAI (Conversational Artificial Intelligence) developed an avatar that answered audience questions in the theatre about the project and sustainable opera.



LoLa (Low Latency AV streaming system) is an ultra-HD, low-latency audio/video system used worldwide for remote musical performances. The technology, developed by GARR and the Tartini Conservatory of Music in Trieste, was created to enable real-time musical performances between musicians located in two or more different places, connected through advanced network services. LoLa (Low Latency) enabled remote rehearsals of the opera, resulting in a travel saving of 7.54 tonnes of CO₂ (equivalent to the absorption capacity of 375 trees working for one whole year). GARR was the associated partner of the project.



Avatar presentation in Linz



Rehearsals with LoLa

Project Outputs



Project Butterfly stand at the Ars Electronica Festival in Linz (September 2025)

A dedicated exhibition about the Butterfly project was featured at the Ars Electronica Festival in Linz, where over five days, 1,472 artists, scientists, activists, and visionaries from 87 countries

came together across 19 venues, presenting more than 684 events and 379 exhibits. With 122,000 visits, this was the most attended edition in the history of the festival. **Ars Electronica is an associated partner of the project.**

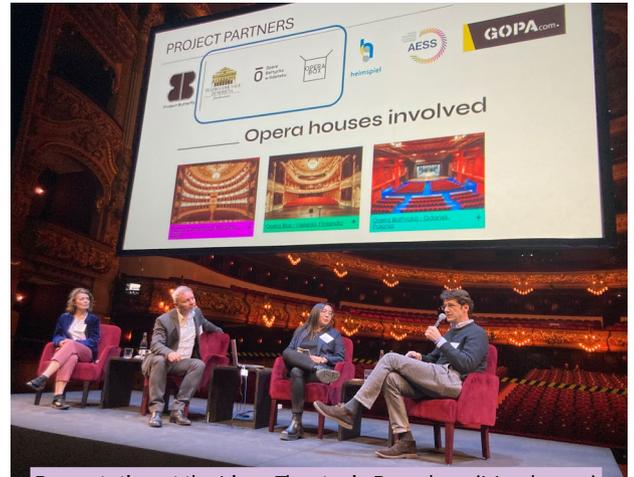
The Butterfly project has attracted international interest and reached hundreds of industry experts interested in its implementation.

In February 2025, it was presented at the **Ministry of Culture in Rome** among the outstanding projects of Creative Europe.

In March, it was showcased at the **Liceu Theatre in Barcelona** during the sustainability forum at the annual Opera Europa conference.



Presentation at the Ministry of Culture in Rome (February 2025)



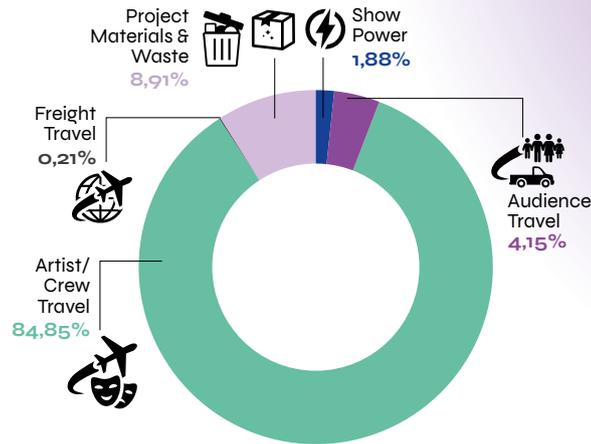
Presentation at the Liceu Theatre in Barcelona (March 2025)

CARBON FOOTPRINT*

On the right are the **carbon footprint results of the production of Project Butterfly**. The emission source that clearly dominates over the others, as shown in the chart below, is **related to the artists' travel**.

This outcome was to be expected: although relatively few artists were involved, most of their journeys were long international routes, often inaccessible by land and therefore requiring air travel.

The data reported enclosed show the impact related to travel during the opera tour, excluding rehearsals that were held remotely using the LoLa tool.



Emissions contributions by sector in the sustainability impact assessment of Project Butterfly

Domestic flights ⁱ		Number of passengers	
Flight description	Distance/No. journeys	Economy	
from Monaco di Baviera to Bolog	810 Kilometres ▼	1	
Shorthaul flights ⁱ		Number of passengers	
Flight description	Distance/No. journeys	Economy	
from Tallin to Bologna	3780 Kilometres ▼	1	
from Helsinki to Bologna	3928 Kilometres ▼	5	
from Gdansk to Bologna	2430 Kilometres ▼	4	
from Varsavia to Bologna	2238 Kilometres ▼	3	

Input data used to calculate emissions avoided by remote rehearsals (LoLa)

* Special thanks to environmental engineer Giulia Donatelli for her study and the publication of the data related to the Butterfly project. Performance impact has been calculated in Modena only.

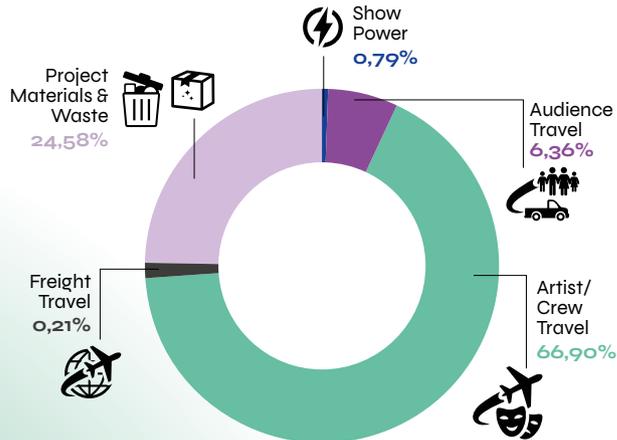
As a separate case, the CO₂ savings made possible by remote LoLa rehearsals were calculated, compared to the emissions that would have been produced by travelling to rehearsals in person in Modena (as shown below, the measurement tool estimated a carbon footprint of 7.54 tonnes of CO₂ equivalent).

This value therefore corresponds to the estimate of the emissions saved thanks to conducting rehearsals remotely, to which must be added the energy savings related to this rehearsal method.



Result of emissions avoided thanks to remote rehearsals (LoLa)

THE CARBON FOOTPRINT OF A 'NON-SUSTAINABLE' VERSION



Emissions contributions of the various sectors considered in the impact calculation of the non-sustainable version of the Butterfly project

Results are also proposed regarding the hypothetical production of a usual, 'non-sustainable' version of the Project Butterfly opera. By modifying, compared to the real case, all input data except those related to energy consumption, an increase in emissions was noted in practically all the sectors involved in the calculation.

The impact categories that weigh the most on the total, albeit in different percentages, are artists' travel and the production of sets and costumes.

COMPARISON BETWEEN THE TWO VERSIONS OF THE OPERA BUTTERFLY

This paragraph proposes a comparison between the results of the two production methods of the Project Butterfly opera. The carbon footprint results produced by the two proposed scenarios are summarised in a single table below.

	Carbon footprint of Project Butterfly – sustainable scenario [tonnes of CO ₂ equivalent]	Carbon footprint of Project Butterfly – usual scenario [tons of CO ₂ equivalent]
Energy consumption	0.44	0.44
Public travel	0.97	4
Project materials	2	14
Transport of scenography	0.05	0.76
Artists' movements	20	37
Total emissions	23,46	56.20

Input data used to calculate emissions avoided by remote rehearsals (LoLa)

With the exception of energy consumption, all other impact categories show **a clear increase in CO₂ equivalent emissions under an hypothetical, non-sustainable, usual scenario.**

Assuming the same initial conditions, namely:

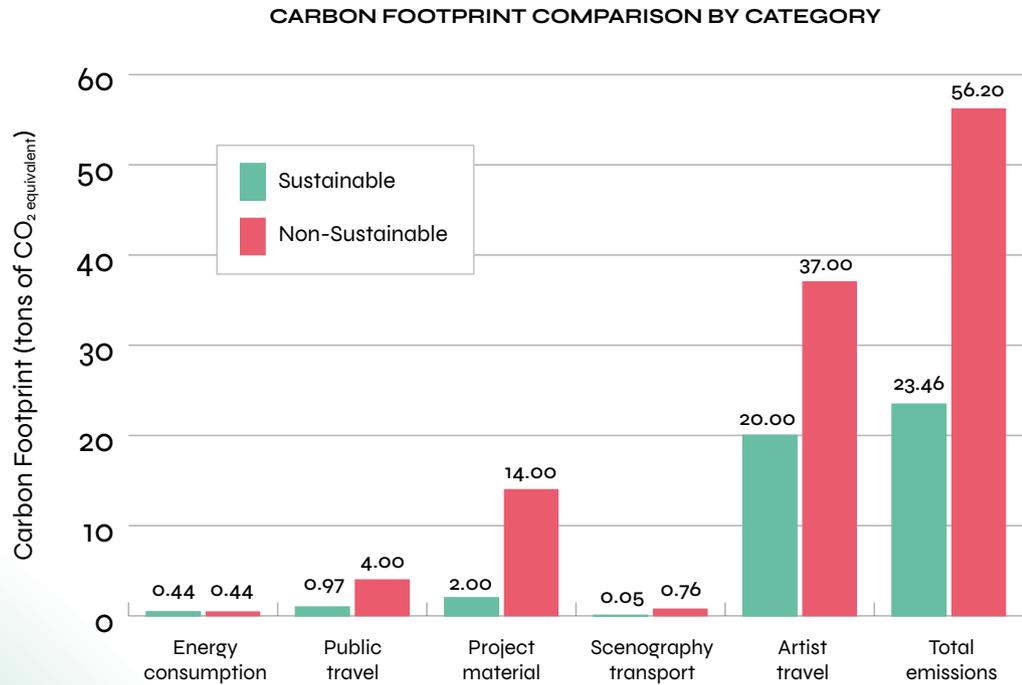
- the same stages of the theatre tour;
- the same energy consumption;
- the same total number of spectators.

The non-sustainable scenario imagines a worse case, characterised by:

- less sustainable means of audience transportation to the theatre;
- greater production of sets and costumes;
- additional transport of sets to account for their return to the Teatro di Modena;
- a larger cast of singers (though no chorus) and consequently an increase in air travel.

Sustainability Results

In this non-sustainable, usual scenario, the total impact amounts to about 56 tonnes of CO₂ equivalent, more than double that of the actual production.



Comparison between the two proposed Project Butterfly scenarios -
The calculation refers only to the performances and production of the opera in Modena



The Butterfly Project represents a pioneering model for the future of opera – one that is inclusive, sustainable, and deeply rooted in the values of collaboration and environmental awareness.

By involving students from three countries in the creative process, the project not only gave voice to the younger generation but also demonstrated how opera can evolve into a platform for civic engagement and ecological reflection. The three one-act operas – Lake of Ashes, Breathe, and Pearl of Hope – each offered a unique artistic response to the environmental challenges of our time, blending traditional operatic forms with contemporary themes and multimedia innovation.

From the use of recycled materials in set and costume design to the adoption of low-emission production practices and remote rehearsals, every aspect of the project was conceived with sustainability in mind. The collaboration between theatres, environmental agencies, and technology partners across Europe has shown that it is possible to create high-quality artistic productions while minimising environmental impact. Moreover, the touring model – based on modular, locally sourced scenography – has set a new standard for eco-conscious performance logistics.

The success of the performances in Modena, Helsinki, and Gdańsk, as well as the enthusiastic response from audiences and the press, confirm the relevance and resonance of this initiative.

More than just a cultural event, Project Butterfly has become a sign of transformation – of how the arts can inspire change, foster dialogue, and build bridges between generations and nations. It is a call to action for the performing arts sector to embrace sustainability not as a constraint, but as a creative opportunity. We believe the legacy of this project will continue to flutter, like the wings of a butterfly, across the European cultural landscape...



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- School No. 16 in Kyiv



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