

D5.1 PROJECT WEBSITE

A written report with visuals summarising the website





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Document history

Version	Date	Contributor	Description
0.1	16 Jan 2024	Pavel Kogut (DRI)	Landing page ready
0.2	Feb-Mar 2024	Susie McAleer, Pavel Kogut (DRI)	Adding blog content and further improvements to the website
0.3	27 Mar 2024	Pavel Kogut (DRI)	Written report with visuals
0.4	27-29 Mar 2024	Tomas Mildorf (UWB)	Review and comments
1.0	29 Mar 2024	Pavel Kogut (DRI)	Final version

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Summary

The project website is one of the most important communication and dissemination tools that BIPED will have, especially in the early stages when no significant results (reports, publications, conference recordings, applications etc.) are available to promote the project.

The website presented in this document is an improvement on the first version (landing page) published in mid-January 2024. Back then, the goal was to establish online presence on a dedicated URL (<https://www.bi-ped.eu/>) to 1) give people a general introduction into BIPED and 2) drive traffic to the website from social media, press releases, partner websites and other third-party resources.

The latest version is a multi-page website that covers key aspects of the project in more detail. The different pages comprehensively address BIPED's:

- **Team:** individual consortium members plus areas of expertise
- **Solution:** the main objectives, research steps and technical architecture
- **Testbed:** objectives and expected impact of pilot activities in Aarhus

In addition, there is a page about results which currently contains just one deliverable (D1.1 Project Vision), a news page listing all the published blogs, and a page about privacy policy which visitors can also access via cookies consent banner.

Two KPIs linked to the project website are 10000 visitors and 200 newsletter subscribers. At the time of writing, BIPED has met 10% of each target: 1007 unique visitors and 21 subscribers. Website traffic is monitored through Matomo, a GDPR-friendly alternative to Google Analytics.

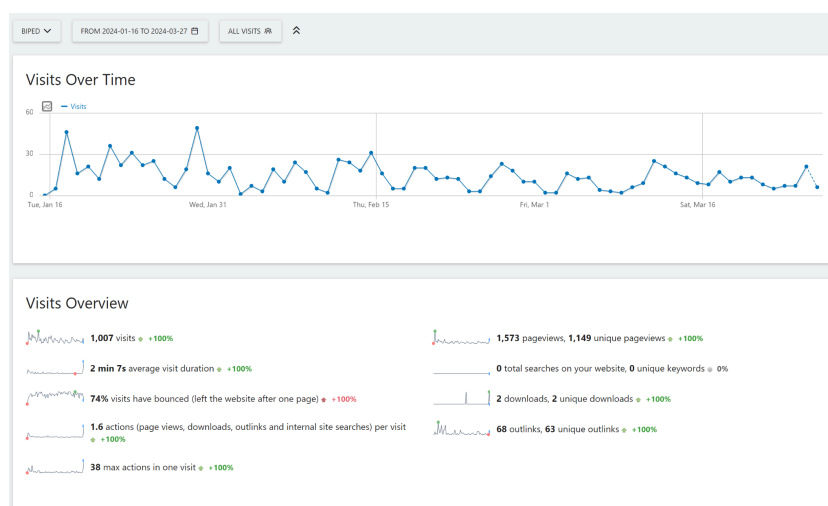


Figure 1. Matomo report Jan-Mar 2024

The website will be continuously updated to maintain and intensify its pull factor. KPIs are important, but they are not the end goal. We want to create an ultimate knowledge hub to enable cities to achieve their climate objectives. And this is what the final website version is going to be.

Home page

The general layout chosen for the homepage is bento grids. It offers a neat way of organising content into nested blocks of varying sizes. The hero section features a responsive 3D city model taken from codepen.io¹ and adapted to the project's colour board. The typewriter effect applied to the text ("building intelligent positive energy district") underscores the AI element in the project's title.



Figure 2. Home page 1/4

¹ <https://codepen.io/richling/pen/jOWJdPX>

Following the introduction is a section on Aarhus districts that want to become energy positive. They are shown on a map so that visitors can easily understand which areas are being targeted and where. The next section explains what PEDs are and how they work.

AARHUS TEST BEDS

BIPED activities target the Brabrand district of Aarhus, with a focus on the Gellerup neighbourhood in the district's east.

[Learn More](#)

HOW PEDs WORK

To achieve positive energy balance, PEDs minimise their energy needs with energy efficiency measures and cover the remaining energy consumption with locally sourced renewables. PEDs rely on smart planning and control measures to optimise how energy is produced, consumed, stored and transferred within district boundaries and beyond. PEDs are therefore not isolated neighbourhood islands but are interconnected, multi-functional areas embedded into a wider energy system. Although PEDs focus on energy, ultimately they are about ensuring wellbeing and sustainability through an ambitious district transformation.

Energy is produced close to consumption to better manage load levels

Renovation measures ensure high level of energy efficiency in the building stock

Locally produced renewable energy contributes to the positive energy balance

E-vehicles can adjust charging or return energy to the grid to optimise the supply of local renewable energy

Figure 3. Home page 2/4

After that, we once again introduce BIPED, this time focusing on its USPs. We conclude with a quote from the project coordinator.

BIPED MULTI-FUNCTIONAL SOLUTION

Data-driven

Heterogeneous data sources are seamlessly integrated to represent PED's complexity in a digital twin.

Transdisciplinary

Cross-domain simulations cover energy, transport, natural and built environment, economic activities and social affairs.

Resilient

Urban communities have the capacity co-create and achieve sustainable futures. The PED community will take shape as a district living lab with innovative collaboration and empowerment of all stakeholders.

Intelligent

ML and AI algorithms enable the self-learning system to optimise energy use for efficient automation of load management in PEDs.

Policy-ready

Operational decisions are driven by evidence of what works best, which in turn informs long-term policy planning.


Interoperable

New MIMs ensure that the necessary technical requirements are met to provide efficient, scalable data-driven services. The use of European standards for data spaces will enable low-level models to inform higher-level aggregated city models employed in urban planning.

Scalable

Open technical specifications and guidance allow cities to replicate and scale the BIPED solution to drive the decarbonisation agenda, especially when it comes to designing and implementing green investment plans necessary to achieve climate-neutrality by 2030.


“ Cities don't just become climate-neutral at once. It's a gradual process that starts at the grassroots level and works its way to the top, covering ever more sectors, dimensions and areas that make up the urban fabric. At BIPED, we help cities to complete this journey through a community-driven systems change that is green, digital, and just.



Martin Brynskov
BIPED Coordinator
Technical University of Denmark (DTU)

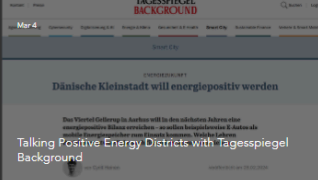
RECENT NEWS

Mar 12



Can Positive Energy Districts Truly Tackle Europe's Carbon Footprint and Make a Difference to Marginalised Groups?


Mar 4



Dänische Kleinstadt will energiepositiv werden

Talking Positive Energy Districts with Tagesspiegel Background

Feb 27



What is a Local Digital Twin and How can it be Applied to Positive Energy Districts?

Figure 4. Home page 3/4

D1.5 Project Website

The last three sections feature recent news, a call to action with animations (moving cubes that react to cursor's movement are meant to elicit excitement, thus nudging people to subscribe), and a website's footer, where we provide contact information, privacy policy, funding acknowledgement, and another site's menu.

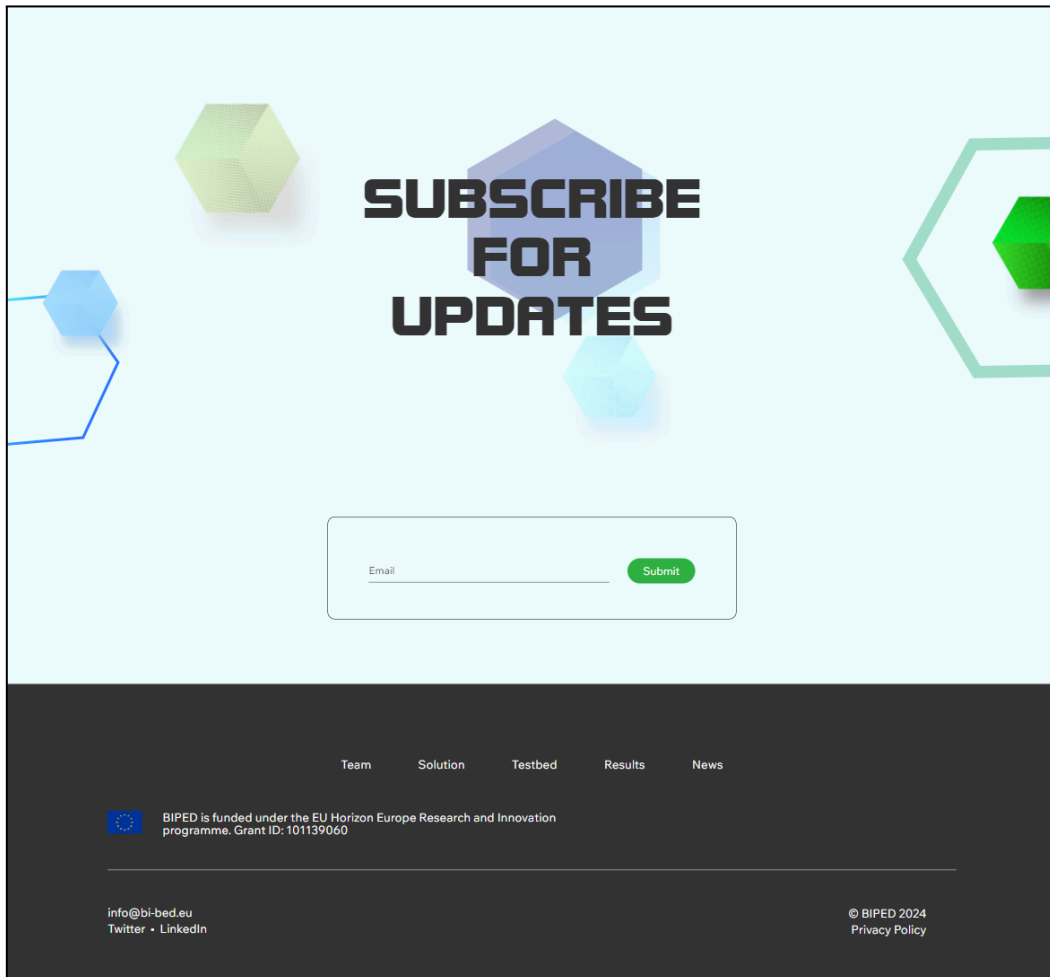


Figure 5. Home page 4/4

Team

This page introduces the BIPED consortium. The aim is not just to say which organisations are part of the project, but to show we have everything we need competence-wise to achieve our objectives. This is done by highlighting different skills that partners bring to the table.

The first section features DOKK1, the multifunctional space in Aarhus where the team had its first meeting. It's visible through a clipping mask stylised to represent a collection of hexagons. There is a direct link to the project logo which is shaped as a cube. One of the cubes has a cursor effect for greater interactivity.

On this and two other pages (solution, testbed) a side navigation bar has been implemented. It's meant to improve user experience by making it easier to navigate text-heavy pages. After a brief introduction and a logo collage, the page proceeds to describe five areas of expertise covered by partners: positive energy districts, digital twins, traffic modeling, legal affairs, and management.

The screenshot shows the 'Team' page of the BIPED project. At the top, there is a navigation bar with links for 'Team', 'Solution', 'Testbed', 'Results', and 'News'. Below the navigation bar is a large graphic featuring a grid of hexagons in various shades of green and blue, with a clipping mask effect showing a building (DOKK1) in the background. The BIPED logo is prominently displayed on the left side of the graphic.

Below the graphic, the page content includes:

- consortium expertise** and the **BIPED** logo.
- A list of expertise areas: PEDs, Digital twins, Traffic modelling, and Legal & MGM.
- A paragraph stating: "BIPED is a pan-European initiative of 13 organisations that joined forces to support Aarhus and other cities in their transition to net zero." It is led by DTU and aims to develop a robust transdisciplinary solution for local climate needs.
- A grid of 13 partner logos: DTU (Danmarks Tekniske Universitet), Aarhus Kommune, AIT (Applied IT), centerdenmark (resilient energy), DKSR (Daten-Kompetenz für Städte & Regionen), Digital Resilience Institute, Innoconnect, KPMG (Open & Agile Smart Cities & Communities), RoadTwin, Západočeská univerzita v Plzni, UTRIUSQUE, and virtual city systems.
- A section titled "Expertise" with a sub-section "Positive Energy Districts". It describes the City of Aarhus's ambition to create cheaper, better, and more sustainable solutions, supported by Center Denmark (CDK) and DTU's research experience.

Figure 6. Team page 1/2

D1.5 Project Website

Digital twins

BIPED's digital twin technology will take advantage of the cutting-edge 3D city models and simulation capabilities provided by Virtual City Systems, while the actual platform will be managed by Daten-Kompetenzzentrum Städte und Regionen. The open-source platform allows urban data to be integrated, linked, and applied as needed to address challenges in various areas of urban design – whether it's more efficient traffic control, more environmentally sensitive building management, or more disability-friendly mobility services.

OASC which coordinates the EU Data Space on Smart Cities and Communities and co-chairs the EU Task Group on Local Digital Twins, and leads the EU and global (UN ITU) standardisation efforts on MIMs, will be instrumental in ensuring the replicability of the final solution and its dissemination to an international network of cities.

The Austrian Institute of Technology, a research organisation part owned by the Federal Ministry for Climate Protection, Environment, Energy and Mobility Innovation and technology, will introduce novel parameters to the digital twin models to better capture the multi-dimensional nature of urban environment in the Aarhus testbeds.

Traffic modelling


The trio leading this work includes 1) Road Twin, a Czech start-up which provides state-of-the-art solutions for web-based traffic modelling in cities and regions; 2) University of West Bohemia which specialises in predictive cross-domain simulations involving traffic, air quality, and noise pollution; and 3) InnoConnect, also from the Czech Republic, which builds custom dashboards and map applications using open source geospatial technologies and big data from IoT networks.

Legal compliance


Utrisque is a law firm that delivered widely acknowledged legal and ethics guides for cities in the DUET Digital Twin project. The company will ensure legal and privacy compliance in BIPED, particularly when it comes to the use of personal data in digital twins.

Management

Digital Resilience Institute is an association with nearly 20 years of experience providing project management, science communication, training, and research services to a wide spectrum of organisations, from local authorities to UN agencies. In BIPED they will be helping DTU with the day-to-day management of the project while also implementing the comms strategy.



[Team](#) [Solution](#) [Testbed](#) [Results](#) [News](#)

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Figure 7. Team page 2/2

Solution

The page comprehensively covers the project concept and methodology, focusing on objectives, research design, and technical approach.

The navigation bar on the side is meant to improve user experience as Solution is the most text-heavy page of the website.

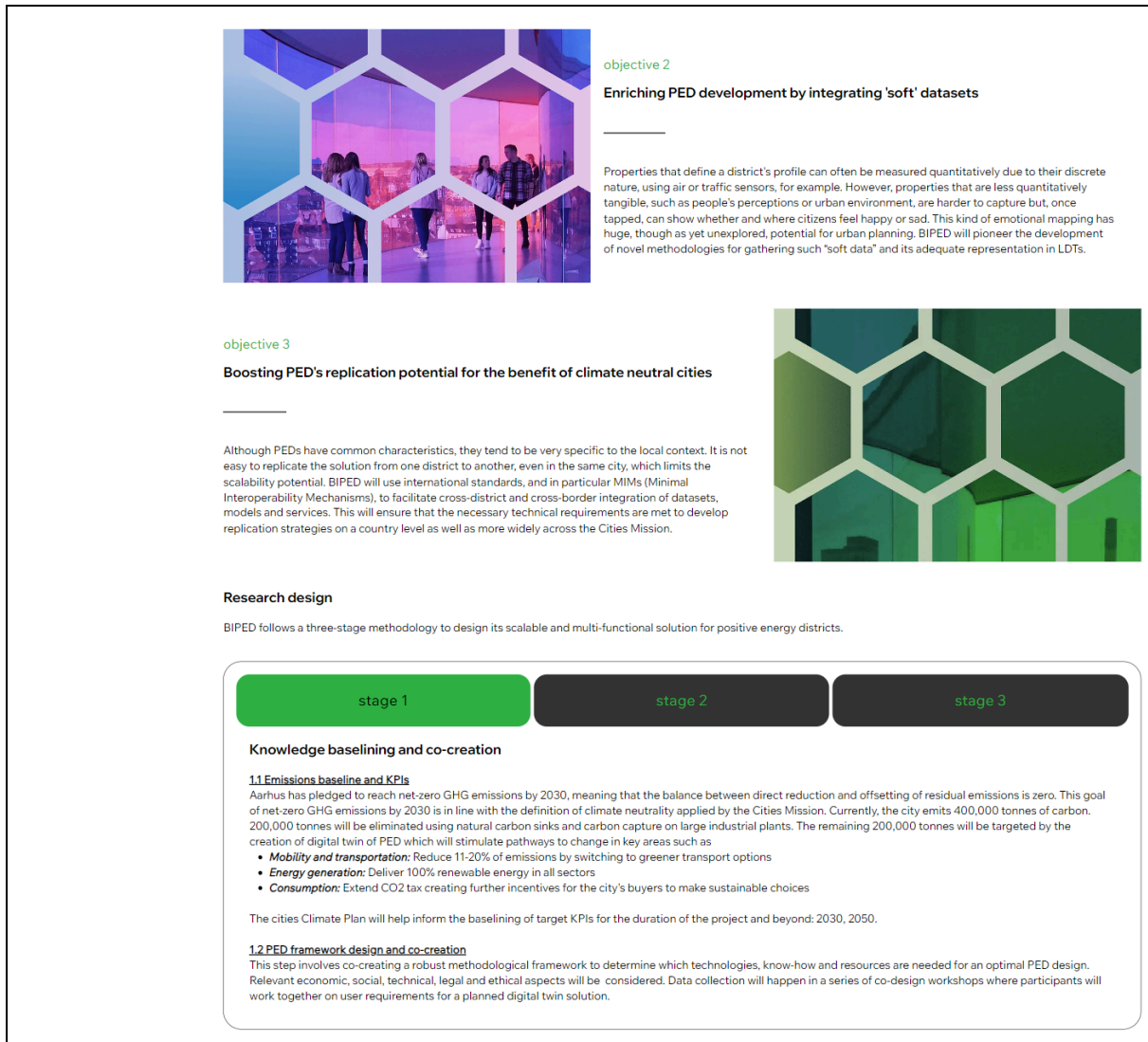
The visual in the first section features ARoS, an art museum in Aarhus. The top cube has the same dynamic element used in all other menu pages. Images in the objectives section are stylised to show a hexagon pattern in line with the brand book.



Figure 8. Solution page 1/3

D1.5 Project Website

A multi-state box is used to organise content in the research design section. Visitors can click through tabs to see which activities are planned in stages 1-3.



objective 2
Enriching PED development by integrating 'soft' datasets

Properties that define a district's profile can often be measured quantitatively due to their discrete nature, using air or traffic sensors, for example. However, properties that are less quantitatively tangible, such as people's perceptions or urban environment, are harder to capture but, once tapped, can show whether and where citizens feel happy or sad. This kind of emotional mapping has huge, though as yet unexplored, potential for urban planning. BIPED will pioneer the development of novel methodologies for gathering such "soft data" and its adequate representation in LDTs.

objective 3
Boosting PED's replication potential for the benefit of climate neutral cities

Although PEDs have common characteristics, they tend to be very specific to the local context. It is not easy to replicate the solution from one district to another, even in the same city, which limits the scalability potential. BIPED will use international standards, and in particular MIMs (Minimal Interoperability Mechanisms), to facilitate cross-district and cross-border integration of datasets, models and services. This will ensure that the necessary technical requirements are met to develop replication strategies on a country level as well as more widely across the Cities Mission.

Research design

BIPED follows a three-stage methodology to design its scalable and multi-functional solution for positive energy districts.

stage 1 **stage 2** **stage 3**

Knowledge baselining and co-creation

1.1 Emissions baselining and KPIs
Aarhus has pledged to reach net-zero GHG emissions by 2030, meaning that the balance between direct reduction and offsetting of residual emissions is zero. This goal of net-zero GHG emissions by 2030 is in line with the definition of climate neutrality applied by the Cities Mission. Currently, the city emits 400,000 tonnes of carbon. 200,000 tonnes will be eliminated using natural carbon sinks and carbon capture on large industrial plants. The remaining 200,000 tonnes will be targeted by the creation of digital twin of PED which will stimulate pathways to change in key areas such as

- **Mobility and transportation:** Reduce 11-20% of emissions by switching to greener transport options
- **Energy generation:** Deliver 100% renewable energy in all sectors
- **Consumption:** Extend CO2 tax creating further incentives for the city's buyers to make sustainable choices

The cities Climate Plan will help inform the baselining of target KPIs for the duration of the project and beyond: 2030, 2050.

1.2 PED framework design and co-creation
This step involves co-creating a robust methodological framework to determine which technologies, know-how and resources are needed for an optimal PED design. Relevant economic, social, technical, legal and ethical aspects will be considered. Data collection will happen in a series of co-design workshops where participants will work together on user requirements for a planned digital twin solution.

Figure 9. Solution page 2/3

The last section before the footer includes an SVG file showing the technical architecture.

Technology

BIPED will build a world-class LDT for the district of Brabrand in Aarhus. Based on the ambitious EU roadmap for Federated LDTs (Digital Europe Programme), MIMS developed in the context of Living-in.EU (MIMS Plus) and the global y.MIM format, the first iteration of BIPED's solution will be created, comprising a detailed semantic 3D model of the physical environment, along with additional geospatial data and soft datasets.

The geometrical and visual representation of the digital twin will feature a terrain model, orthophotos, 3D vegetation models, street furniture models, and building models as specified by the OGC CityGML standard with at least Level of Detail (LOD) 2 geometrical and semantical differentiation. Higher LODs with additional information of facade and roof structures will be created as needed.

Open standards such as CityGML, GeoJSON, GML, GIFT, and open interfaces such as OGC WMS, WFS, WCS, OGC API Features will be incorporated to a) enable live data exchange with existing spatial data infrastructures and b) ensure portability with IT infrastructures of other European cities.

Subsequent iterations will link spatial data with domain specific data and tie in live information from sensors. Depending on local needs and modelling requirements, further integration with traffic networks, IoT sensors, mobility and energy systems may be undertaken to provide an optimal solution for decision making.

On the data management layer, multiple technologies will be implemented to support data storage, processing, filtering and analysis, with each module ensuring the highest level of interconnectivity.

```

    graph TD
      subgraph Application_Layer [Application Layer]
        A1[Digital Twin Viewer]
        A2[Dashboards]
        A3[XR Viewer]
      end
      subgraph Business_Logic [Business Logic]
        B1[City Model Processing]
        B2[Energy Model]
        B3[Mobility Model]
        B4>Data Analytics]
        B5[Catalogues]
      end
      subgraph Urban_Data_Platform [Urban Data Platform]
        U1[Databases]
        U2>Data Broker]
        U3>Data Storage]
        U4[Access Control]
        U5[Connector]
      end
      subgraph Data_IoT_Layer [Data & IoT Layer]
        I1[Sensors]
        I2[City Database]
        I3[Web Services]
        I4[Management Sys]
        I5[GIS Data]
      end
      Application_Layer --- APIs1[Open APIs, OGC Web Services, OGC Feature API, NGSI]
      Business_Logic --- APIs2[Open APIs, OGC Web Services, OGC Feature API, NGSI, REST API, Management API]
      Urban_Data_Platform --- APIs3[HTTPs, Websocket, MQTT etc.]
      Data_IoT_Layer --- APIs3
  
```

[Team](#) [Solution](#) [Testbed](#) [Results](#) [News](#)

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Figure 10. Solution page 3/3

Testbed

The page provides general information on pilot activities in the Aarhus district of Brabrand and its eastern neighbourhood Gellerup. Site descriptions are complete with pictures of the area taken by partners during a study tour that was organised as part of the kick-off meeting. A blog feed is provided at the bottom, linked to Aarhus related categories.

We expect this page to grow in size/content as more results become available, so the side navigation is active here as well. For consistency with other menu pages, we applied the same style to the first section.

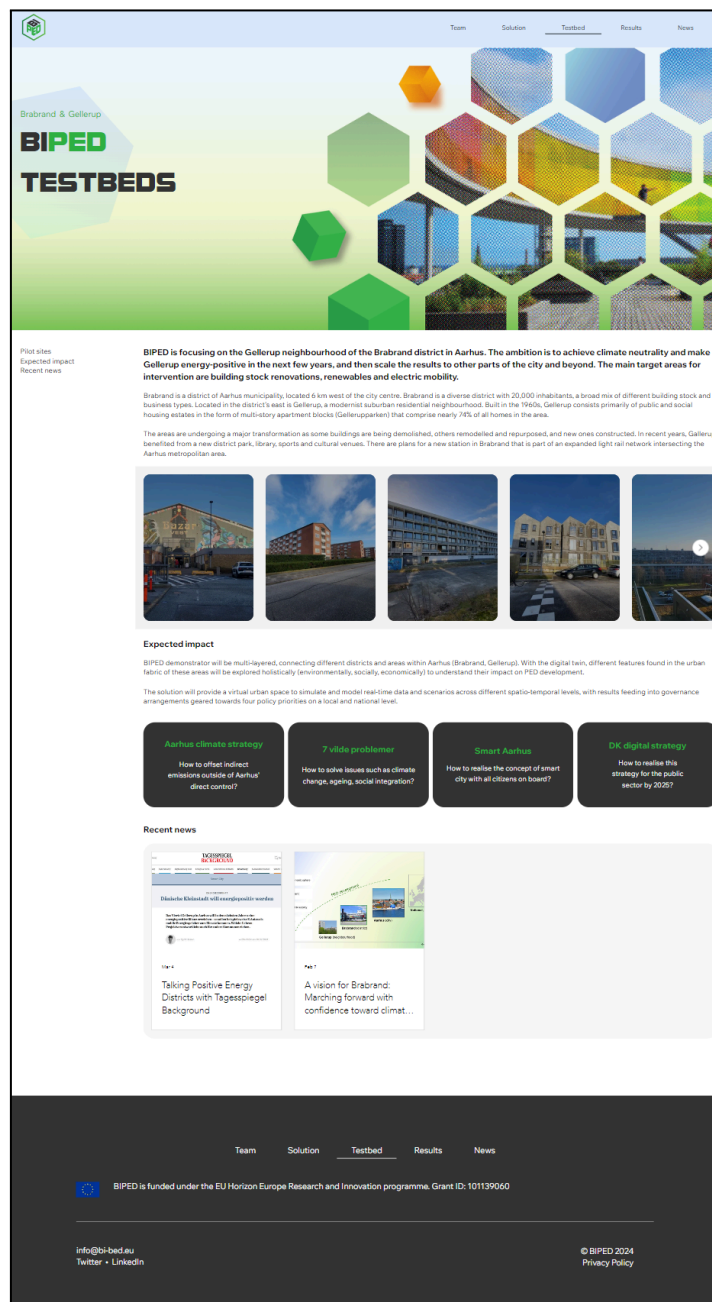


Figure II. Testbed page

News

The page displays a list of blog articles that can be filtered according to different categories. Because of that, no sidebar navigation was added. However, News has the same first section as other menu pages when it comes to look and feel.

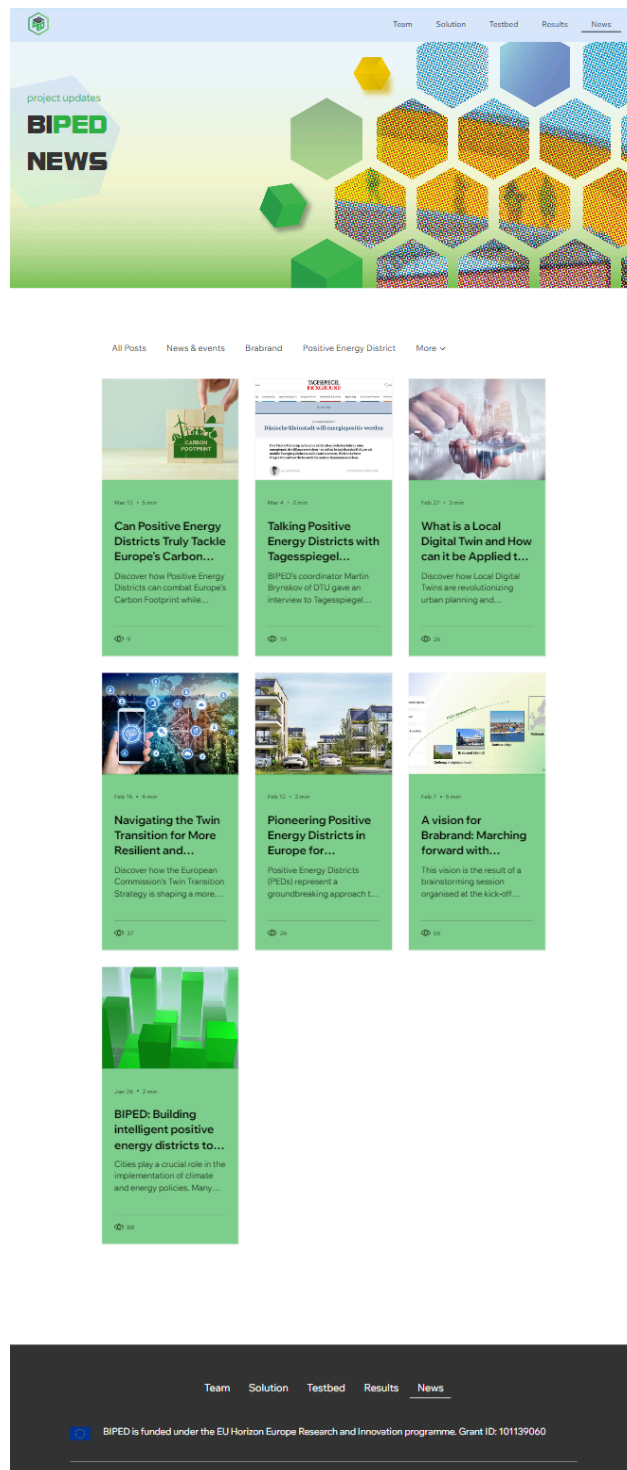


Figure 12. News page

Privacy policy

BIPED's privacy policy explains what type of information we collect, how and why we collect it, how we store and use information provided by site's visitors, how we communicate with them, how we use cookies etc. There are also statements concerning intellectual property and liability. Users can access this page from the footer or via cookies consent banner.

PRIVACY POLICY

This privacy policy ("Policy") provides information on how we collect and process personal data when you visit <https://www.bi-bred.eu/> ("Website"). Users should read, understand and accept the terms set out below when using the Website. If a user has not done this, or does not agree with the contents of the Policy, that user should not make use of any of the services provided via the Website.

Digital Resilience Institute Z. S. ("DR") operates <https://www.bi-bred.eu/> and is the site's Controller according to the General Data Protection Regulation (GDPR). DR takes the protection of your personal data seriously. Below we explain what data we collect during your visit to the Website and how exactly it is used.

What type of information do we collect?

We receive, collect and store any information you enter on the Website. The use of certain services on our website, such as newsletters, blogs or events, may require prior registration and further processing of personal data, for example long term storage of email addresses and visitor IDs. Such data will only be used if you have provided them to us and have given your express consent in advance.

We use software tools (built in Wix analytics and Matomo) to measure and collect session information, including page response times, length of visits, page interaction, and methods used to arrive at the website. No personally identifiable information is shared or detected by any of these tools.

How do we collect this information?

When you interact with our Website through the blog, contact form and subscription form, as part of the process we collect personal information you give us such as your name and email address. Your personal information will be used to be able to get in touch with you after your initial outreach.

Why do we collect it?

We collect personal and non-personal information for the following purposes:

- To provide users and visitors with any necessary feedback
- To interact with and keep interested parties updated on the progress of the BIPED project through newsletters, mailing lists and other data collection tools e.g. surveys
- To be able to contact users and visitors with general or personalised service-related notices and promotional messages
- To create aggregated statistical data and other aggregated and/or inferred non-personal information which may be used to provide and improve our services
- To comply with any applicable laws and regulations

How do we store, use, share and disclose our site visitors' personal information?

The Website is hosted on the Wix.com platform. Wix.com provides us with the online platform that allows us to display information about the project and provide services to you. Your data may be stored through Wix.com's data storage, databases and the general Wix.com applications. They store your data on secure servers behind a firewall.

How do we communicate with site visitors?

We may contact you to send updates about BIPED, to notify about or troubleshoot problems with your account used to become a site member, to resolve a dispute, or as otherwise necessary to contact you to enforce any agreement we may have with you. For these purposes we may contact you via email or any other means that you make available to us. If you contact us through the contact options offered, your details will be saved so that they can be used to process and answer your request. Without your consent, this data will not be passed on to third parties.

Use of cookies

Cookies are small pieces of data stored on a site visitor's browser. The use of cookies increases the user-friendliness and security of the Website. Cookies are typically used to keep track of the settings users have selected and actions they have taken on a site.

Essential cookies are used for important reasons, such as:

- To improve services provided on the Website
- To provide a great experience for visitors
- To identify registered members i.e. users who registered as site members
- To monitor and analyse the performance, operation and effectiveness of Wix's platform
- To ensure the platform is secure and safe to use

As a site visitor you can choose to accept or decline non-essential cookies through a cookie banner displayed at the bottom of the page. It pops up automatically when you visit the website for the first time.

Privacy Policy updates

We reserve the right to modify this Policy at any time, so please review it frequently. Changes and clarifications will take effect immediately after being posted on the Website. All updates will be reflected here so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we use and/or disclose it.

Questions and your contact information

If you would like to access, correct, amend or delete any personal information we have about you, you are invited to reach out to us via the contact form.

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Team Solution Testbed Results News

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Figure 13. Privacy policy