

The Integrator-centric approach for realizing
innovative energy efficient buildings in connected sustainable green
neighbourhoods

The PROBONO project

Positive Energy Neighborhoods for Europe's fair, effective and resilient energy transition

European Sustainable Energy Week, 20th September 2022, Brussels

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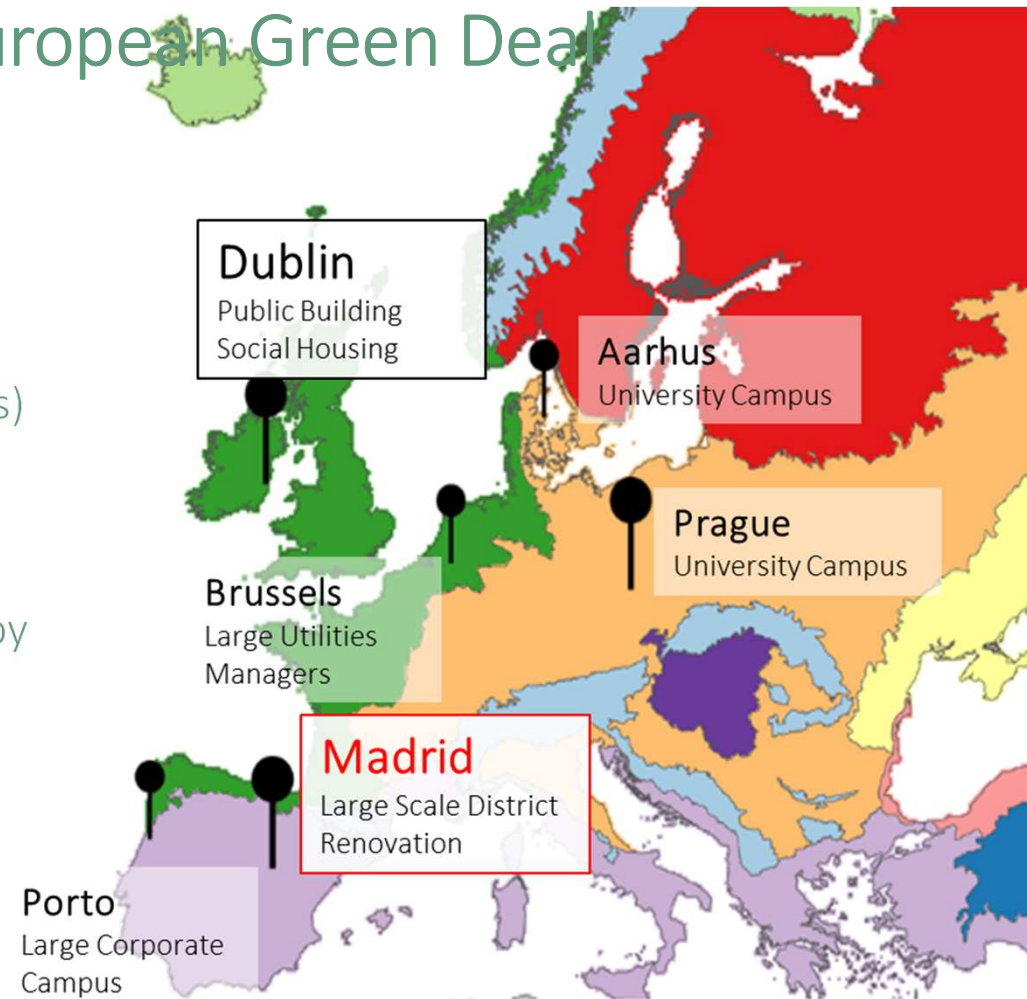
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Main objectives to contribute European Green Deal

Our vision: a people-focused European construction industry that works with a community of stakeholders to create sustainable positive energy and zero-carbon emitting Green Buildings and Neighborhoods (GBNs).

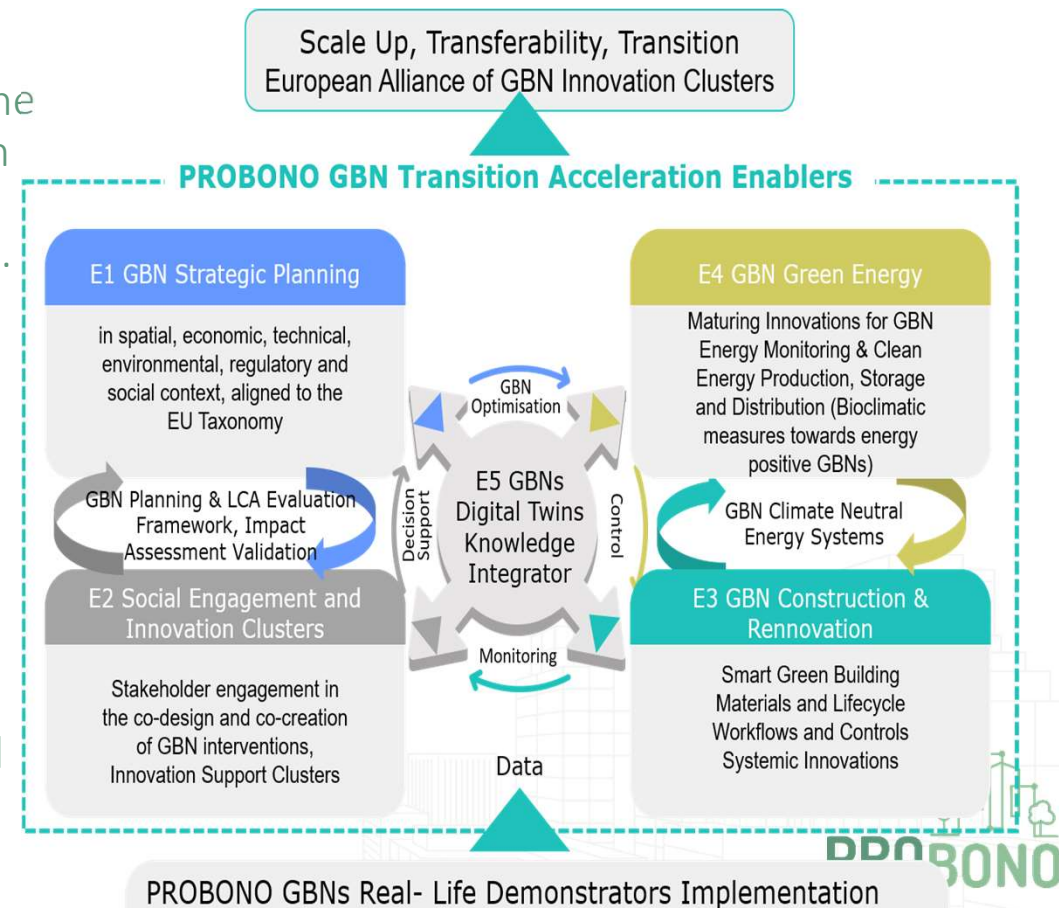
- To turn 6 European districts (PROBONO's Living Labs) into Green Building Neighborhoods (GBN), with positive energy balance and zero carbon emissions.
- Evidence-based policy recommendations, and standards, commercialization strategies supported by a capacity-building program and the European Alliance of GBN Innovation Clusters.



Different vectors to maximize decarbonization potential

ENABLERS supporting PENs, from regulations to the involvement of citizens, pass through construction materials and energy supply models, to take maximum advantage of decarbonization potential.

- PROBONO will provide GBN Strategic Planning Tools in spatial, economic, technical, environmental regulatory, and social contexts aligned with city and urban masterplans and policy frameworks.
- PROBONO will provide a GBN Digital Twin (DT) implemented across the LLs as a virtual representation of associated GBN including operational assets that implicate environmental and efficiency KPI.



Sustainable urban complex regeneration process

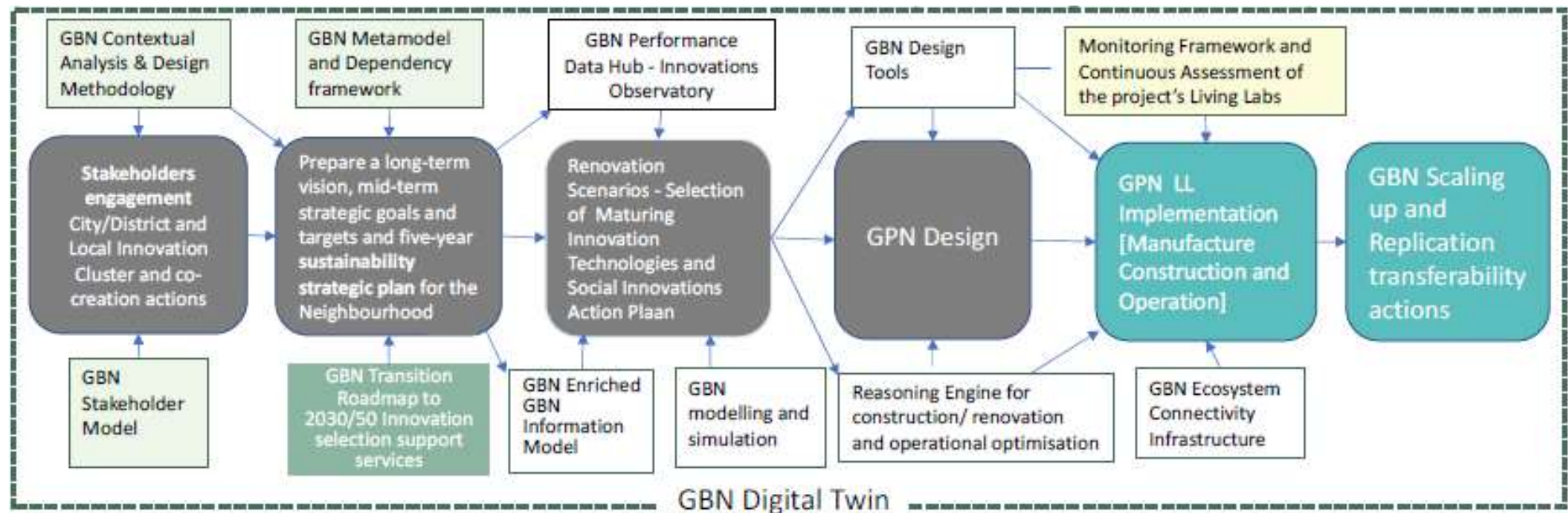
Building and Infrastructure Deep Renovation with GBN's technological and social innovation, in a connected GBN (Green Building Neighborhood)

- Different utilities with electricity, gas, warm energy, cold energy, and water linked to Smart IoT gateway and Energy Optimization middleware.
- All this combined with geothermal, PV, micro-turbines, efficient HVAC technologies, green roofs, custom insulation, and GB energy optimization, efficient energy storage and integrating EV charging value chain.

Green Building Neighbourhoods GBN



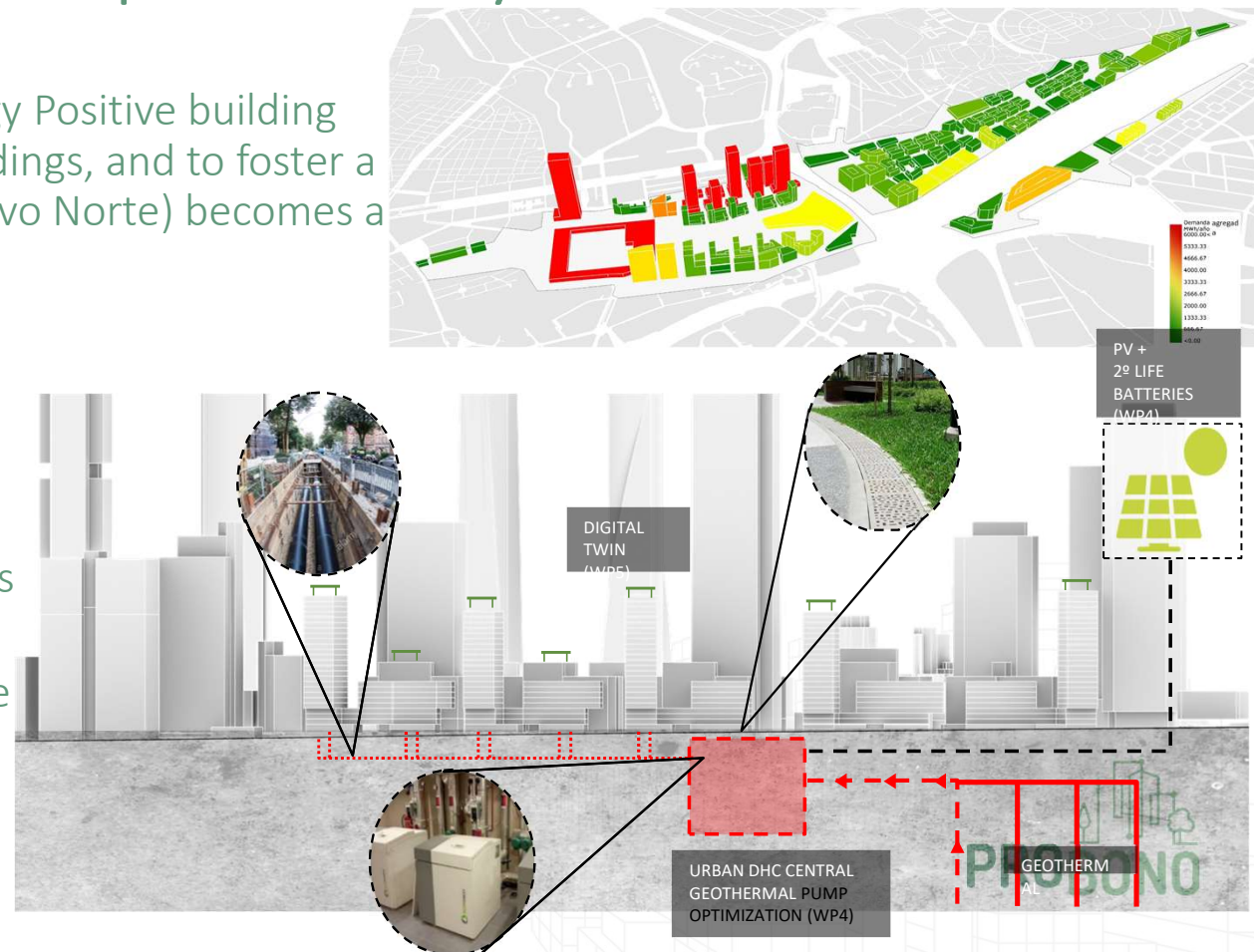
GBN Digital Twin (DT) implemented across the LLs



Business-centric focused LLs promoted by local stakeholders



















The main objective is to achieve the Energy Positive building status for residential and commercial buildings, and to foster a strategy to ensure that MNN (Madrid Nuevo Norte) becomes a neutral district.

- Development of 4th generation renewable district heating and cooling
- Covering the district's thermal demand through geothermic energy
- Using the local green renewable systems to generate electricity
- Take advance of digital twins to enhance sustainability at the district scale
- Facilitate the development of the DHC network in the rest of MNN



Business Models paving the way for wider replication

- Business-centric focused LLs promoted by local stakeholders
- District-led large-scale demonstrators supported by local authorities

Demonstrators Characteristics	Dublin	Madrid	Porto	Brussels	Aarhus	Prague
 Scale of Interventions - GBN Main Driver (D) District level: Greening City - District Plans (S) Site level: Facilities Management DGNB LCA ESG	D	D	S	S	S	S
 City Population Source: Eurostat 2020	1.228.000	3.266.126	951,805	1.215.289	349,983	1.324.277
 LL Strategy and Impact Potential - Market Scope and Number of buildings	Public Buildings Social Housing e-mobility	Large Scale district Renovation	Large Corporate Campus	Large Utilities Managers	University Campus	University Campus
 Construction (C) New construction & Renovation (R) Renovation/Retrofitting						
 Green Buildings Residential and/or non-residential						
 Initiative - Funding Public/Private	Public Private	Private	Private	Private	Public Private	Public Private

LL	LL focus
Dublin	develop a well-integrated GBN, with significant enhancement of the energy efficiency of the buildings in the neighborhood and their integration into a holistic strategy of energy saving, production, and storage. The strategy will further develop the buildings as prosumers of energy providing renewable clean energy for their operation and for the operation of local transportation fleet of EVs.
Madrid	development of Las Tablas Oeste (APE.08.21) and the establishment of common integrated energy infrastructures to fully cover the district's thermal demand through geothermic energy and the electricity demand through solar energy via photovoltaics on buildings and the urban space.
Porto	enable the dynamic matching of local renewable generation and consumption (by buildings and vehicles), by establishing a common Metering and Control Centre for the whole Maia Campus, enabling easy access to green energy through the centralized management and monitoring of smart metering solutions.
Brussels	renovating 2000 m ² out of a total of approximately 7000 m ² , to bring these areas into use for the educational needs of the school and in line with the latest environmental and regulatory requirements of the Green Deal.
Aarhus	an energy park, 2 to 3 large scale renovation projects and the interdisciplinary LL of Campus 2.0 program involving DGNB certification combined with research and GHG inventory.
Prague	explore the solutions developed in Aarhus and extend their DT models for transportation to cover the built infrastructure and energy flows. The plan is to verify the proposed technology and planning tools accuracy on one retrofit demonstrator.

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Read more!

The PROBONO project:

<https://cordis.europa.eu/project/id/101037075>

<https://www.probonoh2020.eu/>



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Thank you!

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