NEB Impact Model

Summary for Cities

Deliverable 1.1 Summary for Cities

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Creating
Actionable
Futures

Document Information

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The New European Bauhaus as an overarching framework

The European Commission states the mission of the New European Bauhaus (NEB) as follows[1]:

'The New European Bauhaus initiative connects the European Green Deal to our daily lives and living spaces. It calls on all Europeans to imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls.

The New European Bauhaus is a creative and transdisciplinary movement in the making!

- It is a bridge between the world of science and technology, art and culture.
- It is about leveraging our green and digital challenges to transform our lives for the better.
- It is an invitation to address complex societal problems together through co-creation.

By creating bridges between different backgrounds, cutting across disciplines and building on participation at all levels, the New European Bauhaus inspires a movement to facilitate and steer the transformation of our societies along three inseparable values:

- **sustainability**, from climate goals, to circularity, zero pollution, and biodiversity
- **aesthetics**, quality of experience and style, beyond functionality
- **inclusion**, from valuing diversity, to securing accessibility and affordability

The New European Bauhaus brings citizens, experts, businesses, and institutions together to reimagine sustainable living in Europe and beyond. In addition to creating a platform for experimentation and connection, the initiative supports positive change also by providing access to EU funding for beautiful, sustainable, and inclusive projects.'

Within CrAFt, **a NEB Impact Model is developed to support the implementation and follow-up of the NEB principles on the ground.**

[1] https://europa.eu/new-european-bauhaus/about/about-initiative_en

Aims and scope of CrAFt's NEB Impact Model

CrAFt's NEB Impact Model is an **assessment and guidance tool geared at a whole systems approach for use in complex urban interventions**. The whole systems approach fully integrates the New European Bauhaus triple bottom line of realising sustainability, beauty and inclusion.

The Impact Model can be put to work both at the district and urban scale levels of intervention.

It is a 'tool to talk', rather than a strictly quantitative indicator system.

It is built in such a way that cities can use their existing indicator sets and monitoring processes as building blocks for the integrated steering, monitoring, and evaluation of their goals through the Impact Model.

In this way the Impact Model is:

- building an evidence base: providing insights and collecting stories and data, with a special focus on documenting co-benefits;
- a tool to cooperate: to talk, discuss, negotiate, and discover – together;
- open, flexible and context-sensitive: existing assessment and guidance tools can be plugged into it;
- filling gaps: complementing cities' pre-existing indicator sets;
- helping to identify blind spots: cross-disciplinary, experiential, qualitative, process-related or other;
- and ensuring that an overarching, whole systems approach is being adopted.

The Impact Model will thus help identify **essential leverage points for systemic change towards climate neutrality and resilience**, by including all aspectual layers of sustainability (ecological, infrastructural, social, cultural, economic, aesthetical, legal, etc.) into innovative models for **local collaborative governance and value creation** that optimally use the co-benefits between the different sectors and minimise potential conflicts.

By functionally linking environmental aspects (materials, energy, water, health, pollution, biodiversity, etc.) to the cultural, social, economic, legal and governance aspects in one perspective, the Impact Model allows to integrate cross-sectoral co-benefits from early intervention phases onwards, and thus to reduce the risk of suboptimal, unilateral or siloed approaches.

Furthermore, many climate-neutral and resiliency solutions have less attractive business cases, and financial aspects are usually discussed rather late in the

process. Integration of financial aspects and co-benefits from the beginning will help to exploit **new value chains** and business opportunities.

Links with other EU initiatives and projects

The Impact Model is aligned with two other instruments, provided by (1) the Mission on Climate-neutral and Smart Cities, through its working platform NetZeroCities (NZC); and (2) the New European Bauhaus (NEB). These instruments are the **NZC Impact Framework with its associated Comprehensive Indicator Framework**[2]; and the **NEB Compass**[3].

While the NZC Indicator Framework is currently under internal review with collaborating cities, it is already clear that CrAFt's NEB Impact Model will have a high degree of interchangeability and complementarity with NZC's Impact Framework.

At the same time, CrAFt's NEB Impact Model will support the creation of an extended evidence basis that helps to realise the strategies formulated in the NEB Compass.

CrAFt's NEB Impact Model is also being tested and fine-tuned in the Horizon Europe funded projects NEB-STAR[4] and Re-Value[5]. The experiences of the 12 cities within these projects in adapting the Impact Model to their local contexts will be fed back into the CrAFt project.

CrAFt's NEB Impact Model at a glance

The Impact Model considers **5 main intervention domains, called 'pillars', and 17 impact categories**.

The 5 pillars consist of the well-known triple bottom line for sustainable development (planet, people, prosperity) complemented by a pillar on quality of life and one on governance.

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[2] NetZero Cities Deliverable D2.4, Comprehensive indicator framework, Nov. 2022: https://netzerocities.eu/wp-content/uploads/2023/01/D2.4-Comprehensive-indicator-framework_v3.pdf

[3] The NEB Compass: https://new-european-bauhaus.europa.eu/get-involved/use-compass_en

[4] https://nebstar.eu/

[5] https://re-value-cities.eu/

The 17 impact categories refer to essential aspects of integrated sustainable development (ecological, infrastructural, social, cultural, economic, aesthetical, legal, etc.). In order to achieve a balanced approach towards integrated sustainability, inclusivity, and beauty, we recommend that all 17 categories are taken into consideration. As one can observe, there is no distinct category for "physical space". Indeed, in CrAFt's NEB Impact Model, physical space is handled as a cross-cutting category, serving as a carrier for all the other functions, including urban governance and development processes.

NEB pillars and basic impact categories		
Governance		Space
1	Integrity	
2	Participation and co-creation	
3	Process quality	
Economic performance		
4	Legal certainty and future economic value	
5	Total societal cost of ownership	
6	Sustainable local embeddedness	
Social-cultural performance		
7	Cultural sustainability	
8	Sociability	
9	Affordability and inclusivity	
10	Effectiveness of services	
Healthy living		
11	Indoor environmental quality	
12	Outdoor environmental quality	
Environmental performance		
13	Sustainable mobility	
14	Sustainable land use	
15	Healthy, secured water cycles	
16	Circularity - Materials	
17	Climate neutrality - Energy	

Figure 1: 5 pillars and 17 impact categories of the Impact Model.

Within the 17 impact categories, we have identified a variety of relevant indicators, based on both methodological research and dialogues with the CrAFt Cities and their stakeholders. The Impact Model suggests **a list of 46 indicators, intended as an indicative set** of primary Key Performance Indicators (KPIs) that are already largely known and used by most cities. The list is intended to guide the selection of indicators from existing sets and reporting tools already in use by the city, the project or the process at stake. At the same time, the pillars, impact categories and suggested indicators help to **detect possible gaps as well as additional opportunities**.

Typical gaps we identified among the CrAFt Cities thus far, are indicators related to social and cultural sustainability, experiences and processes; these are often considered as "subjective" and "qualitative" and hence are not properly taken into account in decision-making. In addition, the CrAFt Cities have identified the urgent need to be able to document the added value of cross-disciplinary cooperation, i.e. how the indicators interact with each other; this type of information would support cities to better discuss co-benefits and trade-offs across municipal units and with societal stakeholders.

Figure 2: CrAFt's NEB Impact Model with 5 pillars, 17 impact categories and 46 suggested indicators.

The nature of the indicators varies from strictly quantitative (like CO_2-emissions or the modal split of passenger travel) to highly qualitative (like reflexive governance). For many indicators, a composite assessment based on the evaluation of several sub-indicators will be recommended. Furthermore, (sub-)indicators may be evaluated by using proxies, until a better indicator is found or developed. For example, a proxy for the accessibility of a service may be the average distance to that service. Indicators may be assessed by a mix of quantitative and qualitative sub-indicators. For example, social network quality in

a district may be assessed both by counting the number of neighbourhood associations and community events, and by asking residents and users for a qualitative judgement of the social networks in that given neighbourhood.

Some aspects like education or health care do not appear in the indicative set. This is intentional, in order not to overburden the assessment framework. However, related effects are being assessed. For example, the output of education is reflected in local human capital, while quality of life indicators directly influence public health (and thus reduce the burden on health care).

It is up to the user to decide how elaborate the evaluation of the indicators will be, and which particular (sub-)indicators will be used. In order to avoid that such an approach leads to user bias, the Impact Model foresees an integrity check at the level of governance. Through self-reflection, the group of stakeholders engaged in a given project or process is expected to check compatibility with overall NEB-inspired goals, completeness of the assessment, proper alignment of agendas and stakeholder interests, and adequate selection of relevant (sub-)indicators.

The Impact Model is grounded in a knowledge theory called Multimodal System Analysis (MMSA)[6].

[6] A description of MMSA can be found in Vandevyvere, H. (2011), How to cut across the catchall? A philosophical-cultural framework for assessing sustainability, in: International Journal of Innovation and Sustainable Development, 5(4), 403-424. https://doi.org/10.1504/IJISD.2011.043331

The importance of co-benefits

In order to boost investments and secure political commitment in NEB urban transitions towards climate neutrality and resilience, and better plan and implement actions in context, identifying and quantifying both direct and indirect benefits of the envisaged action is instrumental.

Mapping and quantifying co-benefits

Certain co-benefits that return to the investor can be reasonably estimated, like increased real estate value through energy-retrofit of existing buildings. However, co-benefits like decreased social and health care costs through more healthy living environments may be very difficult to quantify. In addition, the beneficiary of those co-benefits is often not (only) the project initiator or the investor.

For this reason, we suggest a balanced business case by adopting a 'total cost of ownership for society' perspective. Total cost of ownership for society requires that multiple actors covering the entire return spectrum participate in developing the project (how this can be done, will be covered extensively by CrAFt's upcoming Cookbook). Alternatively, a redistribution mechanism can be put in place – one could think of e.g. a tax rebate for helping to realise a more healthy environment, based on tangible indicators.

Co-benefits in the realm of urban climate neutrality and resilience

Sustainable urban development and climate action planning enable a broad set of co-benefits. There are obvious co-benefits one may expect to realise when setting up interventions in an urban (re)development context, like building retrofit, sustainable new-built, mobility infrastructure interventions, projects dealing with green-blue infrastructure and RES production; in addition, we explore co-benefits that are currently less documented, originating from cultural and artistic interventions, the impact of identity, belonging and ownership among residents and other local stakeholders, and educational and recreational projects.

Furthermore, there is a second sphere of broader societal co-benefits that go beyond specific projects or interventions, such as:

- **Higher energy independence** through the provision of local RES and other sustainable energy sources like recovered waste heat;

- **Reduced energy poverty** through both increased energy efficiency and RES production;
- **Reduced social and health expenditure** due to higher well-being and health in sustainably conceived living and working environments or in properly retrofitted buildings[7] and infrastructures;
- **Less pollution, better and safer living environments and thus higher quality of life** through better indoor- and outdoor environmental conditions;
- **Increased physical/crime safety and traffic safety** through properly designed public spaces and mobility infrastructures;
- **Higher employee productivity, less absenteeism, better recovery in hospitals, etc.** through healthy, comfortable and pleasant indoor environments in buildings, providing appropriate indoor air quality and (natural) ventilation, applying low-emission building materials, providing daylight access, solar control (both allowing or blocking the sun depending on conditions), attractive outside views, green outdoor spaces at short walking distance;
- **Less traffic congestion with related economic costs and health gains from active transport modes** while realising a modal shift towards sustainable transport modes, including reductions in health expenditure;
- **Higher real estate value** of energy-efficient (renovated) residential and non-residential buildings including 'futureproofedness' regarding future (energy) requirements. These gains may be direct (related to the building itself) or indirect (related to its environment). An example of the latter aspect is the higher price of real estate in streets with trees, compared to the same type of buildings in streets without trees[8];
- **Better, more social and beautiful public spaces**: in particular by reducing the reliance on private car or motorbike use – meaning both a reduction of travelling and parked cars or motorbikes – public space can regain a multitude of qualities, restoring it as a place for encounter, playing and relaxing. This comes in addition to related safety and health benefits stemming from reduced private car and motorbike use;
- **Reduction of the urban heat island** by green-blue infrastructures in cities, reducing ambient temperatures in the urban tissue while at the same time diminishing the active cooling loads in buildings and transport. In a similar

[7] A rare example where project actors have assessed the (mental) health co-benefits of living in healthier and more energy-efficient, retrofitted homes is Warm Homes Oldham: https://www.theguardian.com/society-professionals/2016/nov/30/guardian-public-service-awards-2016-sustainability-winner-warm-homes-oldham

[8] See e.g. https://greenblue.com/gb/how-trees-increase-property-values/

vein, green-blue networks can improve **flood risk management,** help to **replenish groundwater tables**, increase local **biodiversity** and improve **air quality** if properly designed[9]**.** They thus play an important role in climate adaptation. In addition these green-blue assets increase the mental well-being of citizens apart from the primary functions for which they were designed (parks, recreational areas, gardens, green façades, canals, sports fields, etc.);

- **More local employment in green sectors** (energy-efficient building renovation, renewable energy production, public transport, local food production based on sustainable agricultural methods, etc.); hence less financial flows outwards ('money leaks') and more **re-injection of resources** into the local economy;
- **Increased opportunities for the circular economy**, where many lower-skilled jobs can also be created in disassembly, recovery, repair and revaluation;
- **Less critical dependence on international supply chains and thus more resilience** by closing loops locally as much as possible, e.g. through urban mining and circular economy;
- **Less dependency on process water,** for example as stated in the report Energy Darwinism II: 'Renewable resources such as solar and wind need little or no water resources when compared to fossil fuel power generation which needs water for cooling purposes. This could make a huge difference to water scarce countries that rely on freshwater for cooling in power generation.' [10]

[9] E.g. trees in narrow streets may rather block air pollution in those streets, so both the mobility design as well as the greenery design must account for such risks.

[10] Channell, J. et al. / Citigroup (2015), Energy Darwinism II: Why a Low Carbon Future Doesn't Have to Cost the Earth, p. 36, available at https://www.ourenergypolicy.org/wp-content/uploads/2015/08/ZTGI.pdf

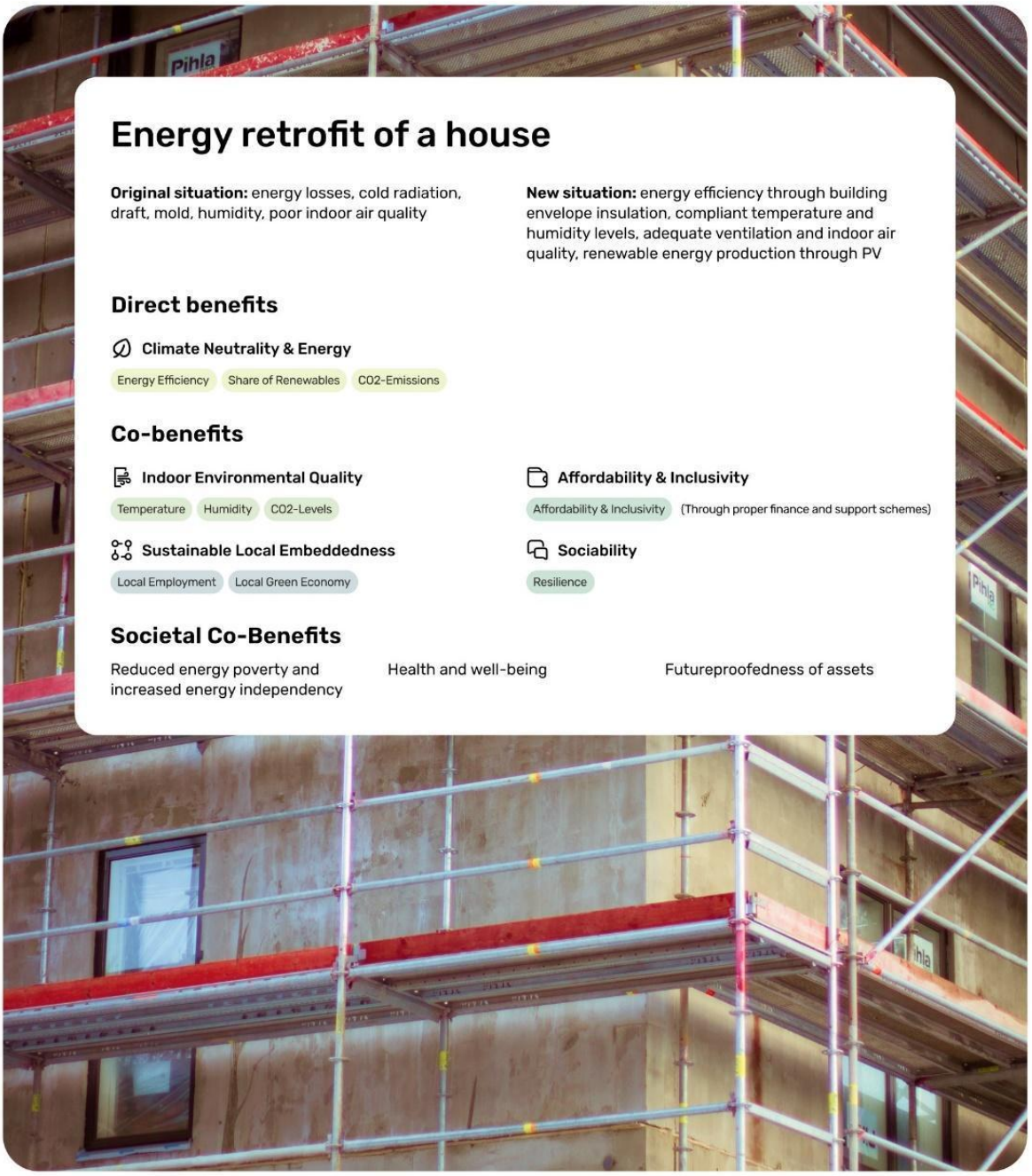
Three examples of impact chains and co-benefits

Three selected cases illustrate how CrAFt's NEB Impact Model can be used to identify co-benefits, together with decision makers and stakeholders. The set of identified co-benefits in the examples is not necessarily exhaustive, and we believe that future projects could realise even more such co-benefits, building on the experiences within their own or other cities.

The examples include a summary box for an intervention with key characteristics and identified impact categories, and then show the identified co-benefits and their connections to each other in an interference diagram.

Example 1: Energy retrofit of a house

Energy retrofit of a house not only results in energy and CO_2-emission savings, the house also becomes more comfortable and healthy to live in (indoor environmental quality), more affordable in terms of energy bills, and better secured against energy poverty. This implies increased health and well-being for the inhabitants, and thus corresponding health care cost savings for society as a whole. Renewable energy production may be applied as a retrofit measure, adding to the win-wins. This also holds for society, as both energy efficiency and renewable energy production increase energy autonomy. The retrofit works support the local economy and employment; because that local economy grows in a greener direction, human capital and sustainable local embeddedness can be leveraged in that direction too. The overall building stock is being future-proofed, adding to its sustainable asset value.


Energy retrofit of a house
Original situation: energy losses, cold radiation, draft, mold, humidity, poor indoor air quality
New situation: energy efficiency through building envelope insulation, compliant temperature and humidity levels, adequate ventilation and indoor air quality, renewable energy production through PV
Direct benefits
Climate Neutrality & Energy
Energy Efficiency
Share of Renewables
CO2-Emissions
Co-benefits
Indoor Environmental Quality
Temperature
Humidity
CO2-Levels
Affordability & Inclusivity
Affordability & Inclusivity
(Through proper finance and support schemes)
Sustainable Local Embeddedness
Local Employment
Local Green Economy
Sociability
Resilience
Societal Co-Benefits
Reduced energy poverty and increased energy independency
Health and well-being
Futureproofedness of assets

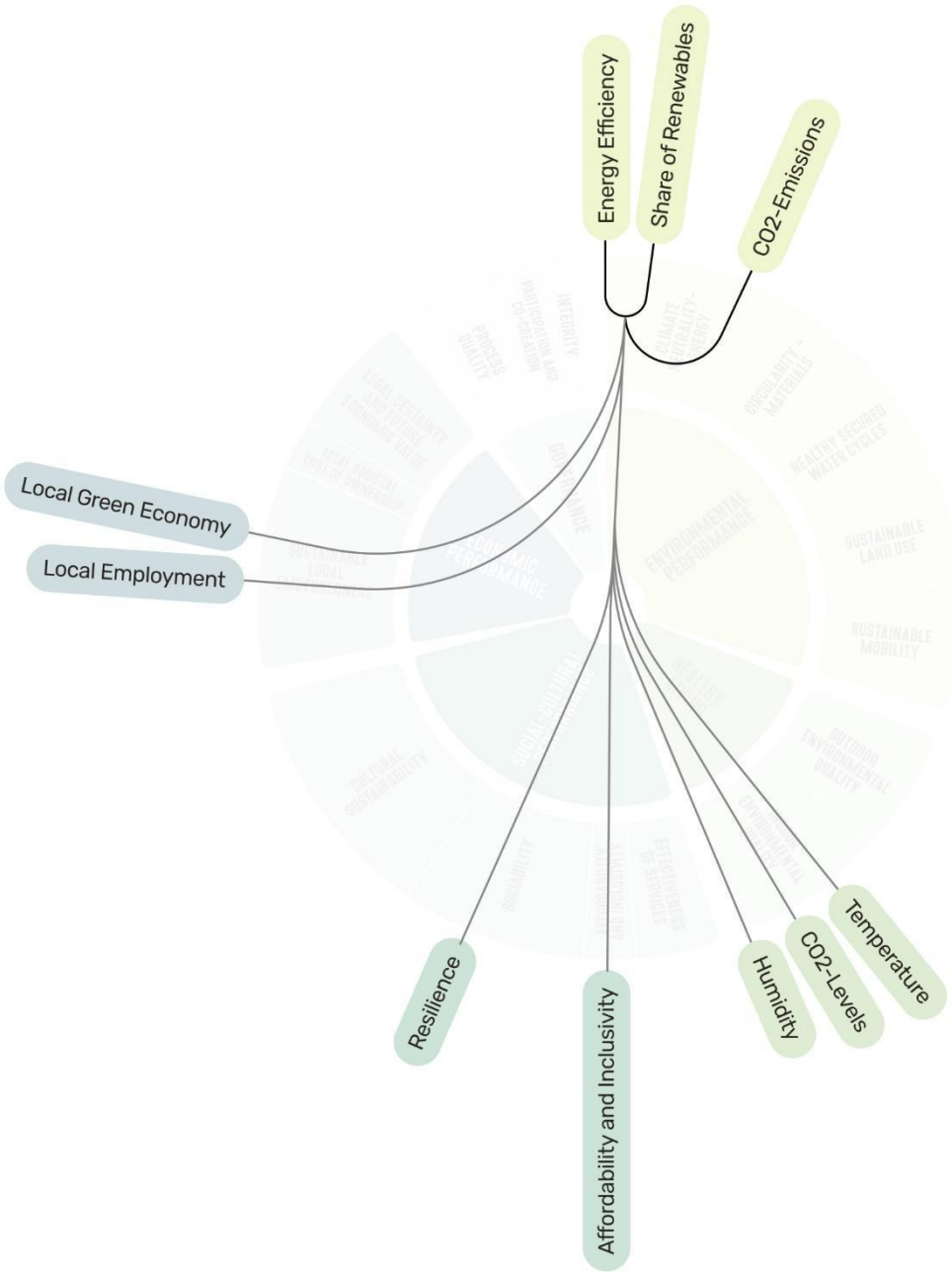
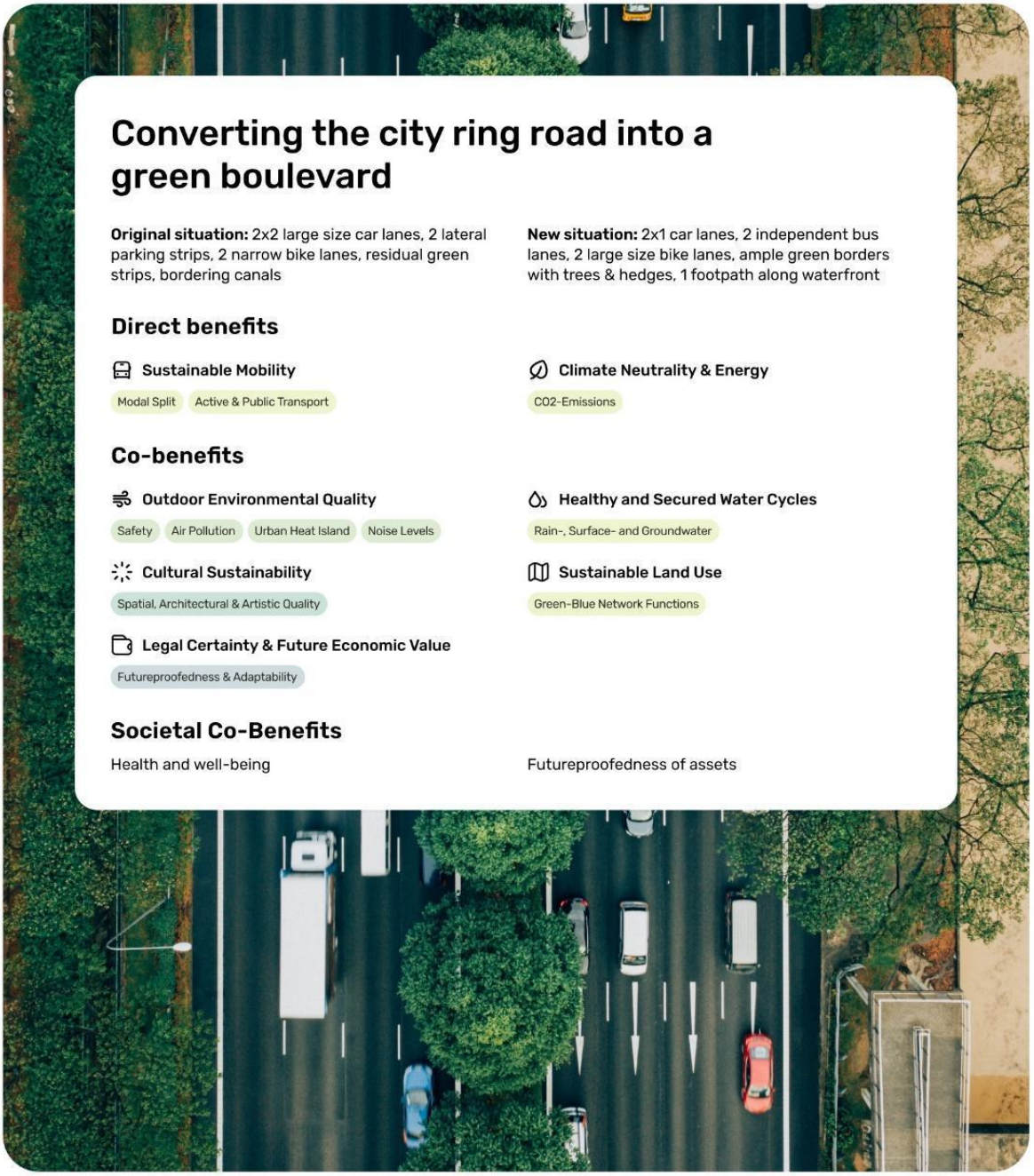


Figure 3: Summary box and interference diagram of indicators for the energy retrofit of a house.

Example 2: Converting the city ring road into a green boulevard

Converting the city ring road into a green boulevard: imagine we transform the 2x2 wide car lanes, the car parking strip on each side, 2 narrow biking paths plus the strips of residual green of a city's ring road into an urban boulevard with 2x1 narrow car lanes, 2 separate bus lanes, 2 wide cycle paths and all of that bordered by rows of trees, shrubs and hedges. This improves sustainable mobility: less space for cars, better conditions for walking, biking and public transport. CO_2 emissions go down. It also increases physical/traffic safety because the volume and speed of cars is reduced. Air quality improves. Noise levels go down. Land use is greener, allowing for biodiversity to increase. Green-blue networks are better valorised. Rainwater can better penetrate the ground. The greening operation also helps to reduce the urban heat island: asphalt is a heat collector; green is the opposite. Landscape quality and scenic beauty are increased, and public space becomes more sociable.


Converting the city ring road into a green boulevard
Original situation: 2x2 large size car lanes, 2 lateral parking strips, 2 narrow bike lanes, residual green strips, bordering canals
New situation: 2x1 car lanes, 2 independent bus lanes, 2 large size bike lanes, ample green borders with trees & hedges, 1 footpath along waterfront
Direct benefits
Sustainable Mobility
Modal Split
Active & Public Transport
Climate Neutrality & Energy
CO2-Emissions
Co-benefits
Outdoor Environmental Quality
Safety
Air Pollution
Urban Heat Island
Noise Levels
Healthy and Secured Water Cycles
Rain-, Surface- and Groundwater
Cultural Sustainability
Spatial, Architectural & Artistic Quality
Sustainable Land Use
Green-Blue Network Functions
Legal Certainty & Future Economic Value
Futureproofedness & Adaptability
Societal Co-Benefits
Health and well-being
Futureproofedness of assets

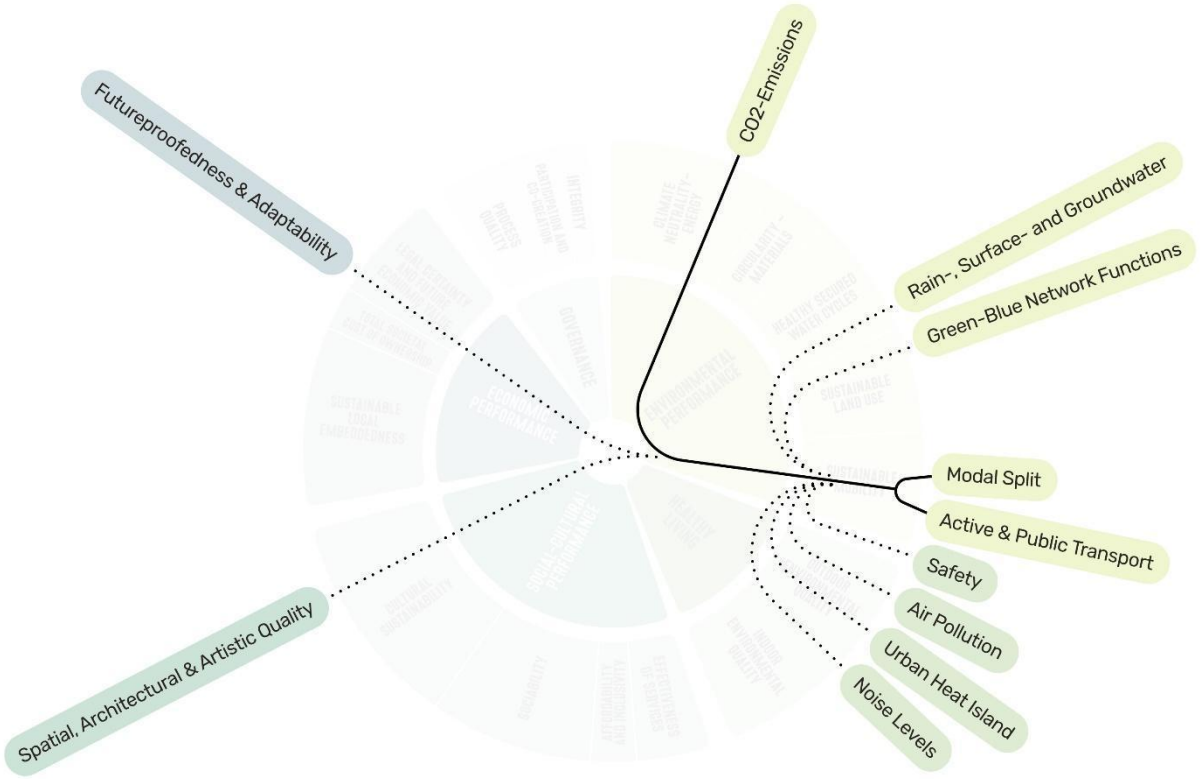
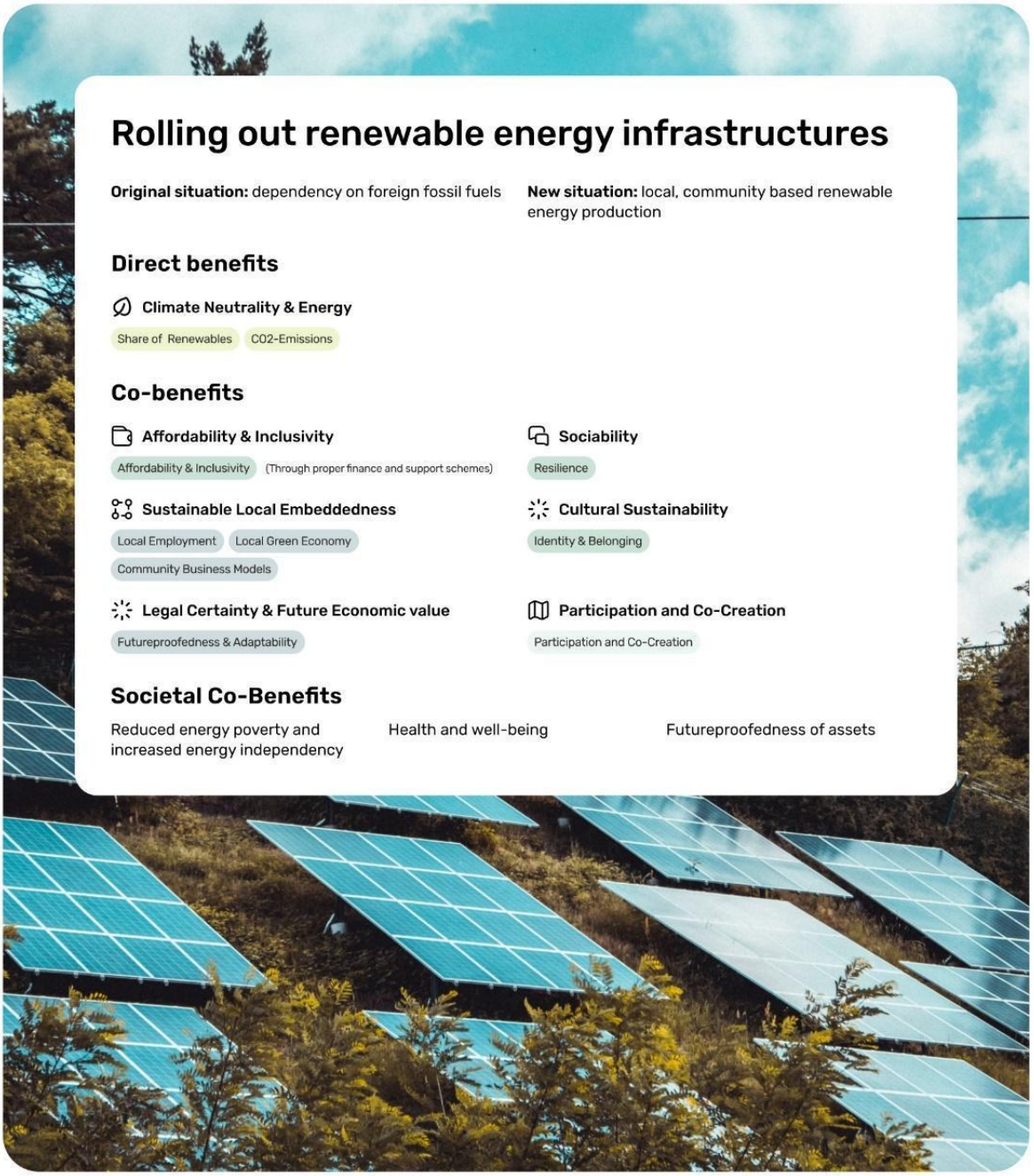


Figure 4: Summary box and interference diagram for converting a city ring road into a green boulevard.

Example 3: Rolling out renewable energy infrastructures

Rolling out renewable energy infrastructures not only helps to reduce CO_2 emissions and increase energy autonomy, doing so also requires a local skilled workforce to build, exploit and maintain the infrastructure. By not spending money on fossil fuels, a money leak outward of the local economy is stopped and the financial benefits can thus be re-injected in the local economy, causing an upward spiral. The local economy needs capacity for this, thus creating demand for more local human capital. Both highly and lowly skilled workforce is needed, increasing the inclusivity of the economy. Affordability of energy is better guaranteed by the local RES assets. Futureproofness and asset value also increase by realising the RES infrastructures, and in a greener and future-proofed city the general health and well-being levels will increase. An energy cooperation or energy community to manage the assets may further support community business models, which in turn provide for stronger local anchoring, co-creation and social inclusion.


Rolling out renewable energy infrastructures
Original situation: dependency on foreign fossil fuels
New situation: local, community based renewable energy production
Direct benefits
Climate Neutrality & Energy
Share of Renewables
CO2-Emissions
Co-benefits
Affordability & Inclusivity
Affordability & Inclusivity
(Through proper finance and support schemes)
Sociability
Resilience
Sustainable Local Embeddedness
Local Employment
Local Green Economy
Community Business Models
Cultural Sustainability
Identity & Belonging
Legal Certainty & Future Economic value
Futureproofedness & Adaptability
Participation and Co-Creation
Participation and Co-Creation
Societal Co-Benefits
Reduced energy poverty and increased energy independency
Health and well-being
Futureproofedness of assets

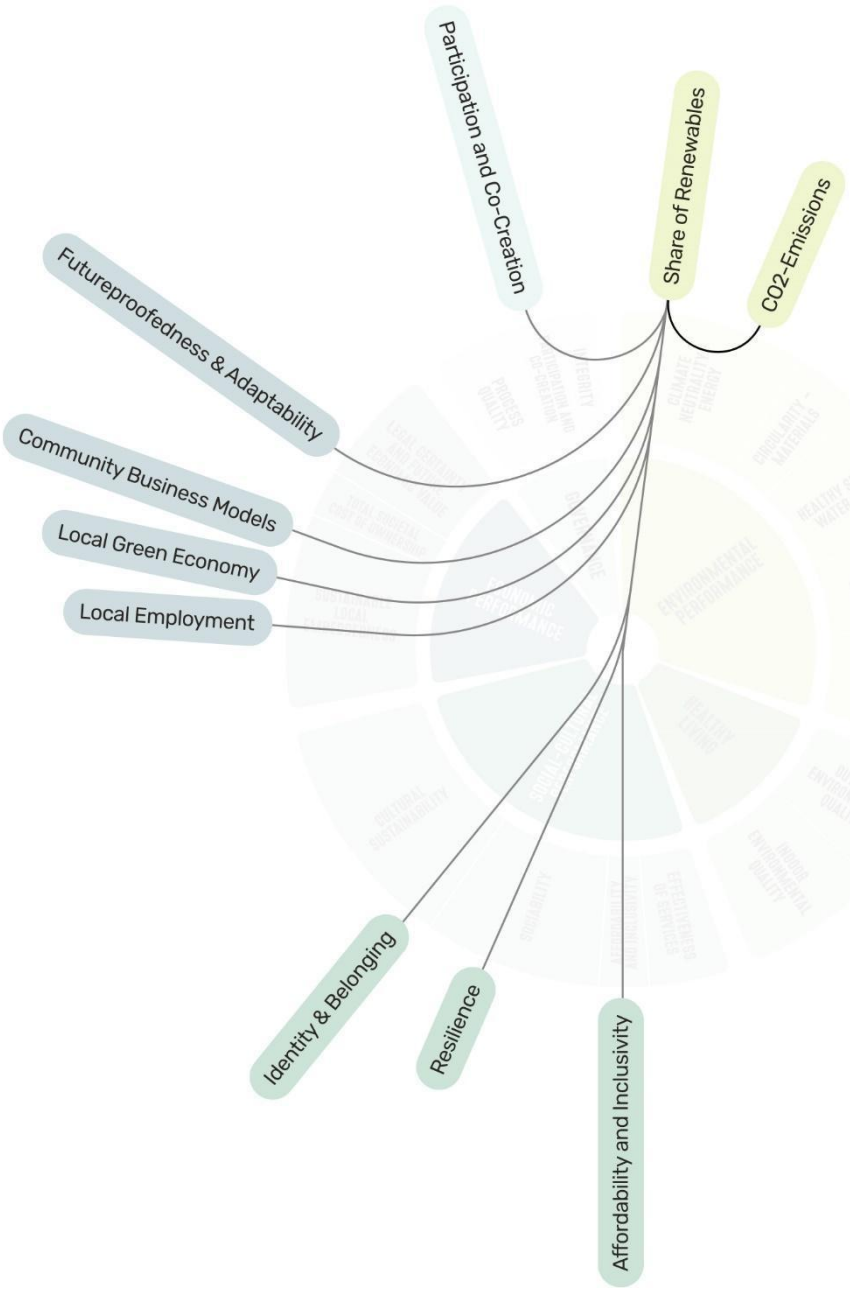


Figure 5: Summary box and interference diagram for rolling out renewable energy infrastructure through a community initiative.

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