A NEW
EUROPEAN
BAUHAUS
ECONOMY

DESIGNING OUR FUTURES

INVITATION
PAPER V.01

desire an irresistible circular society

Funded by
the European Union

Dark Matter Labs 03 Dm

This paper has been developed by Dark Matter Labs as part of the New European Bauhaus lighthouse project, Desire – an Irresistible Circular Society. The project is funded by the European Union.

This first working version of the paper draws upon our team's preliminary research and interaction with relevant European actors. It is a collaborative and constructive contribution to the New European Bauhaus movement.

It will be further developed over the course of the next twelve months with a series of in-person and on-line engagements.

This version presents a 'straw dog' that can be tested, iterated and dismantled over the course of the year. We welcome your criticism and verification of our analysis and projections. We hope that together we can strengthen and improve what is set out in the following pages.

A final version of the paper will be launched at the New European Bauhaus Festival in Brussels in April 2024.

The paper has been developed by Indy Johar and Ivana Stancic, with valuable inputs from Emily Harris, Jayne Engle, Martin Lorenz, Oliver Burgess and Zehra Zaidi from Dark Matter Labs.

We would also like to thank our partners in this work: Bloxhub and Dansk Industri and our first collaborative partners in dialogues: Don Brenninkmeijer (Chair Investment Committee at Laudes Foundation, Chair at Built by Nature), Kirsten Dunlop (CEO, EIT Climate-KIC), Hélène Chartier (Director of Urban Planning and Design, C40 Cities), Hans Joachim Schellnhuber (Founder & Managing Director, Bauhaus Earth) .

Names are listed in alphabetical order.

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Contents

1. About this work

1.1. The need for fundamental transformation at speed and scale

The realisation of the scale and severity of the polycrisis [1] is forcing us to systematically re-evaluate the speed and scale of the transition facing our built environment.

The original Bauhaus movement drove the industrial transformation of design and manufacturing in the twentieth century. We propose that the New Bauhaus movement will need to fundamentally transform our world, establishing new relationships between tangible assets, intangible assets, craft, automation and civic engagement economies.

The transition facing our cities and bioregions is substantive, structural and systemic. It is likely to change how and what we account for; how we interact with and use spaces; how we live and work; and how we design our built environment. The transformation we face requires a New Bauhaus economy.

Apart from design and creativity, our new reality could require new ethics, governance, institutions, accounting regimes, regenerative investments, smart services and systems.

A New European Bauhaus Economy explores what is emerging at the intersection of the material and immaterial, highlighting how these new value flows can support the shift towards a regenerative future for our built environment.

1.2. Building capacity for inter-sectoral innovation

Our work over the next twelve months seeks to build shared comprehension amongst leading European actors who are driving the systemic transition of Europe's built environment. This extends across both public and private sectors,

A New European Bauhaus Economy explores what is emerging at the intersection of the material and immaterial, highlighting how these new value flows can support the shift towards a regenerative future for our built environment.

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aiming to establish a shared understanding of the economic foundations of a New Bauhaus for the twenty-first century.

Together, we seek to map out the new landscape of constraints and abundances that will shape our new economy. We will explore how collective action can drive the transition at the necessary scale and speed; how we can collectively transform our cities and bioregions; and how we can design our future together.

We aim to identify and outline the capacity needed for innovation across sectors, encompassing legislation, finance, civic structures, engagement, education, innovation, energy, resource governance, our relation to nature, land and biodiversity. We will explore how new alliances, scaling from cities to national organisations to transnational partnerships, can drive an agile, cross-sectoral transition of Europe's built environment.

This paper seeks to open spaces for the necessary cross-sectoral dialogues. How can we act at the scale and speed required? How can we recast our everyday world in a systematic and agile way?

1.3. Developing a collaborative contribution to the New Bauhaus movement

Through conversation, we aim to explore how to leverage our collective force to transform our cities and design our future.

We begin at the UIA World Congress of Architects with a panel discussion in July 2023. This will be followed by the Copenhagen Roundtable in Autumn 2023. A series of conversations, debates and interviews will follow over the twelve months of the project, shaping the development of this paper.

A final version of the paper will be launched at the New European Bauhaus Festival in Brussels in April 2024.

This paper seeks to open spaces for the necessary cross-sectoral dialogues. How can we act at the scale and speed required? How can we recast our everyday world in a systematic and agile way?

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Image: Unsplash + Dark Matter Labs


e polycrisis
Continued degradation of climate change
Insufficiency of current climate targets
Incremental change leading to false narratives on solutions
d planetary boundaries
Low circularity levels and inefficient use of resources

2. The scale of transition

Before we can determine future pathways, the perspective of the current reality needs to be rebuilt, recognising the scale and complexity of the challenges that confront us, as well as the foundational shifts affecting our world.

This chapter is aimed at establishing a shared understanding of the structural constraints and abundances that we face over the coming decades.

2.1. Even our most ambitious pledges[2] lead to climate disaster[3]

It is increasingly recognised that the built environment is responsible for approximately 40% of global carbon emissions[4].

However, what is less well known is that hitting net-zero pledges will only limit global warming to around 2.1°C[5] by the end of the century - a result which will drive severe consequences, including life-threatening heat waves, food and water scarcity, coastal flooding and species extinction.

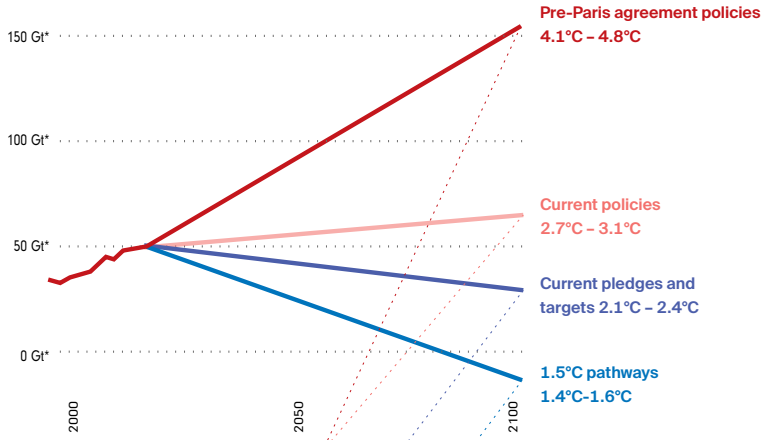
A reality which requires us to not only expand our targets but also recognise and adjust to the foundational constraints to actually achieving these targets.

2.2. We have crossed many of the tipping points[6] and planetary boundaries[7] and are racing towards the others

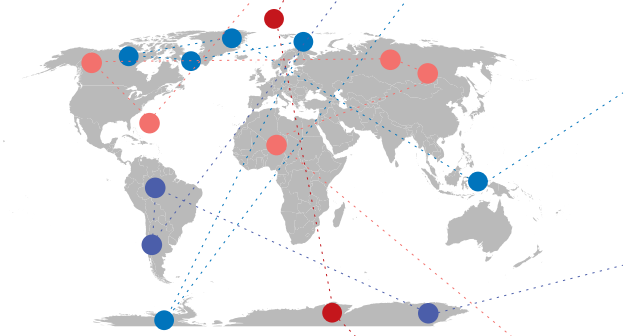
Most recent studies conclude that we have crossed tipping points with the 1.1°C of global warming caused by human activity[8]. In 2009, we had exceeded three of the nine interlinked planetary boundaries, which represent a safe operating space for humanity. By 2023, that number had risen to six[9], with an increased

Even our most ambitious pledges lead to climate disaster

Global greenhouse gas emissions
in gigatonnes CO2-eq. per year



Tipping points



Effects

+1: THE ARCTIC AND ANTARCTICA ARE MELTING: The Gulf stream is weakening. Glaciers are melting affecting freshwater supply. Hurricanes, droughts, heatwaves and large wildfires are more frequent. Ice-free sea absorbs more heat and accelerates global warming. Corals are bleaching.Low-lying coastlines are flooded. Wildlife is in decline.

+2: A PRESCRIPTION FOR LONG-TERM DISASTER: Ice-free summertime in the Arctic. Irreversible loss of the West Antarctic Ice Sheet. Climate breakdown. Deadly dengue fever. Insect crops pests.Conflagration of the Amazon rainforest. Hundreds of millions exposed to deadly heat. Loss of glaciers affects freshwater supply. More floods.

+3: VEGETATION EMIT CARBON AND SPEED WARMING: Ice sheets and glaciers partly collapse. Sea-level rises to 8-14 metres. Extreme high tides, floods, superstorms and super- hurricanes. Hundreds of millions of people are forced to relocate. Wildlife disruption.Half the world's population is exposed to deadly heat waves. Invading deserts. Mass starvation. Death of the Amazon rainforest.

+4: GLOBAL WARMING IS UNSTOPPABLE: Substantial areas of the planet are biologically uninhabitable for humans. Climate refugee numbers become unmanageable. Half the world's land surface becomes 'arid'. Extreme droughts and floods. Category 6 super-hurricanes. Synchronous failures of major world food crops. Potential ice- free planetary state. Mass extinction.

ILLUSTRATION 1: Global policies and pledges effects on greenhouse gas emissions and warming scenarios, overlaid with data on the tipping points and effects and outcomes of those warming scenarios, highlighting the inadequacy of both current policies and ambitious pathways. Visualisation by Dark matter labs based on (Illustration source 1 on page 43)

likelihood of crossing them all.

This reality forces us to recognise the intersectional nature of the crises that we are facing; the carbon crisis cannot be addressed without reimagining our material and ecological world and economic growth and innovation models.

2.3. Our current development models result in dangerously accelerated use of materials, increases in energy consumption and emissions

Carbon emissions and the overshooting of planetary boundaries are unlikely to decrease as long as GDP continues to increase.

Global GDP is linked to 99% of energy consumption and close to 100% of material use. Current economic forecasts predict an average of 2–3% GDP growth per year, which equates to doubling our energy and material use every 25 years.

Despite impressive technological and efficiency gains, absolute decoupling of GDP from energy on a global scale has not been achieved to date[10].

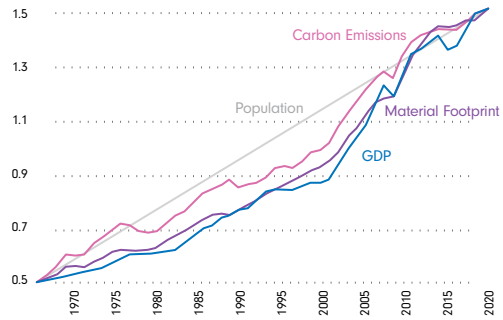
This is largely driven by a rebound effect[11] , with improvements in technological efficiency prompting increased demand and greater resource consumption[12]. This relationship is complex, involving diverse institutional and individual behaviors, but it highlights that our current notion of green growth remains a dangerous fantasy.

2.4. Our built environment costs us our nature and health

Our material extraction currently accounts for more than 35% of global biodiversity loss and water stress[13]. Our built environment is responsible for over 40% of European material extraction[14] and 35% of Europe's waste[15]. Its greenhouse emissions are 14 Gt CO2e each year, exceeding global emissions from coal-fired power plants[16].

Not only are buildings carbon-intensive and ecologically destructive during their construction, but their performance has a significant impact on our health and our planet's health once we start using them[17].

The carbon crisis cannot be addressed without reimagining our material and ecological crisis and our economic growth and innovation models



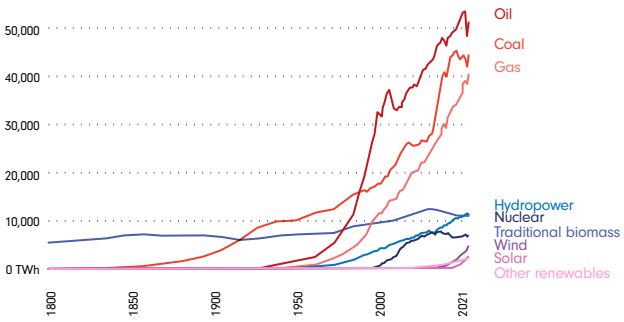


ILLUSTRATION 2: Carbon emissions and overshoot of planetary boundaries are directly correlated to GDP and population increase. Visualisation by Dark Matter Labs based on (Illustration source 3 on page 43); ILLUSTRATION 3: Data showing that fossil fuels remain our primary energy sources. Visualisation by Dark Matter Labs based on (Illustration source 4 on page 43)

2.5. Everyone talks about circularity, almost no one is doing it[18]

Right now, the global economy is only 7.2% circular. As material extraction continues to increase, circularity is on the decline.

Global annual material extraction levels may double to 184 Gt by 2050 if we continue on our current trajectory. Despite ambitions set out in the Circular Economy Action Plan for the European construction sector, material recovery rates across the EU are still far from acceptable[19].

2.6. Our clean energy transition is a dirty affair

Solar and wind facilities require up to 15 times more concrete, 90 times more aluminum, and 50 times more iron, copper, and glass than fossil fuels or nuclear energy[20].

Green technologies require the use of rare minerals whose mining is anything but clean, causing heavy metal discharges, acid rain, and contaminated water sources. It is estimated that three billion tons of mined metals and minerals will be needed to power the energy transition.[21]

A recent report[22] identifies the mining industry as the second-most-polluting industry in the world- and the green energy transition would catapult this to number one, meaning our planned green transition is far from being green.

Global mineral reserves supply chains and reserves may be insufficient to supply enough metals to manufacture the necessary non-fossil fuel industrial systems[23], meaning we don't have enough access to materials for the planned green transition.

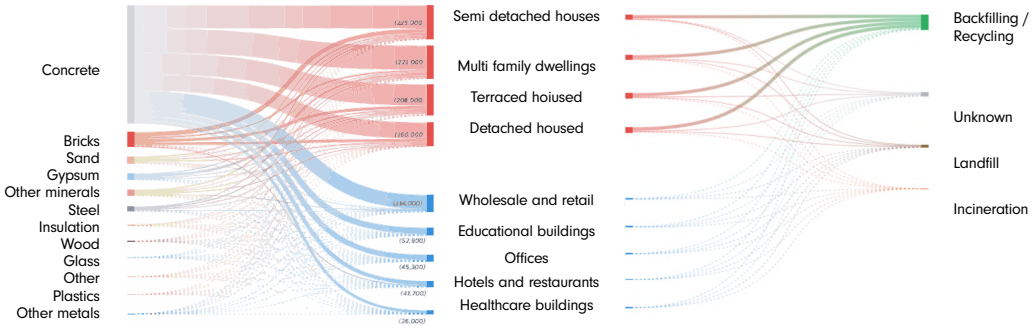
2.7. Our planned green transition generates multiple tensions

Production and processing of critical materials for climate transition are geographically concentrated, compounding geopolitical tensions and supply risks.

Our current green transition is based on rare materials global supply chains[24], but the EU has already identified critical supply risks for the renewables sector[25].

Only a handful of countries are currently responsible for planetary mineral resource production. The combination of resource concentration and material scarcity can and will drive geopolitical risks, tensions, migrations, violent conflicts and human rights violations[26].

Solar and wind facilities require up to 15 times more concrete, 90 times more aluminum, and 50 times more iron, copper, and glass than fossil fuels or nuclear energy



Right now, the global economy is only 7.2% circular, and on the decline.

ILLUSTRATION 4 : By far the most used material in the building industry are unsustainable materials, Material flow analysis of material consumption in European built environment (Illustration source 5 on page 43)

Mining and the processing of materials at the necessary scale will accelerate exploitative labour practices and human rights abuses. The situation has and will be exacerbated by increased demand for these materials.[27]

2.8. Use of biogenic materials could be as harmful as traditional practices

A timber building harvested from old growth forests generates similar, if not higher, carbon emissions than a typical concrete structure.[28]

Increased use of timber and other biomaterials offer significant potential for reducing the embodied carbon emissions of buildings and providing pathways for long-term carbon storage, as well as supporting more regenerative forestry practices. However, there are also significant risks associated with an unregulated increase in demand for timber. These include deforestation, reduced biodiversity and loss of habitat.[29] Further increasing our biomaterials economy is also reliant on reducing the demands of large-scale agricultural land use.

The current production of hemp, straw, timber and other biomaterials often relies on monoculture growth and unsustainable processing, which is harmful to the land and biodiversity. We need to develop regenerative land use methods to establish a sustainable biomaterials future.[30]

2.9. Our carbon budget allows us to build only for ten more years

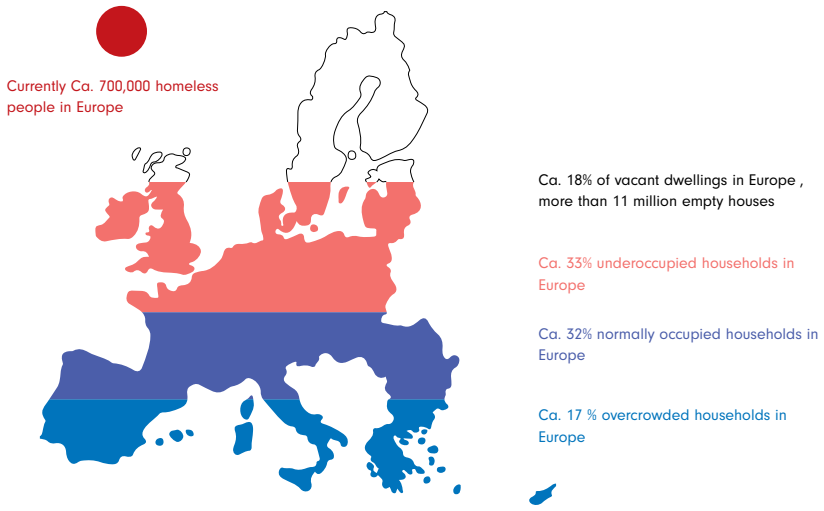
The EU's total remaining built environment carbon budget for a 50% chance of limiting warming to 1.5°C is around 15 Gt CO2e.[31] At current emission rates, this will run out in approximately ten years. Our own research suggests that in such a scenario we may only be able to build 176,000 new homes a year across all of Europe.[32]

To meet targets aligned with the Paris Climate Agreement, the carbon content of new buildings must drop by 94% by 2050.[33] In Denmark, the government has introduced a regenerative, negative target, aiming for 110% carbon reduction by 2045.[34]

2.10. Exceeding planetary boundaries is inevitable unless there is systemic change

Recent research concludes that the Danish building industry needs to reduce its carbon

As we keep building more, 18% of European real estate is vacant, and 33% under-occupied.



A timber building harvested from old-growth forest generates similar, if not higher, carbon emissions than a typical concrete structure.

ILLUSTRATION 5: We are using our built environment inefficiently. Data on Household occupancy, household vacancy and homelessness rates. Visualisation by Dark Matter Labs based on (Illustration source 6 on page 43)

footprint by 97%, achieving greenhouse emissions levels of less than 0.4 kgCO2eq/m2/year to remain within planetary boundaries.[35]

To put that into perspective, the most advanced carbon reduction initiatives, including the future housing project Living Places[36] (2.5 kgCO2eq/m2/year) and the biogenic school[37] (6.7 kgCO2eq/m2/year), highlight the limitations of the current system even for the most innovative. Without systemic redesign, we will be unable to remain within planetary boundaries.

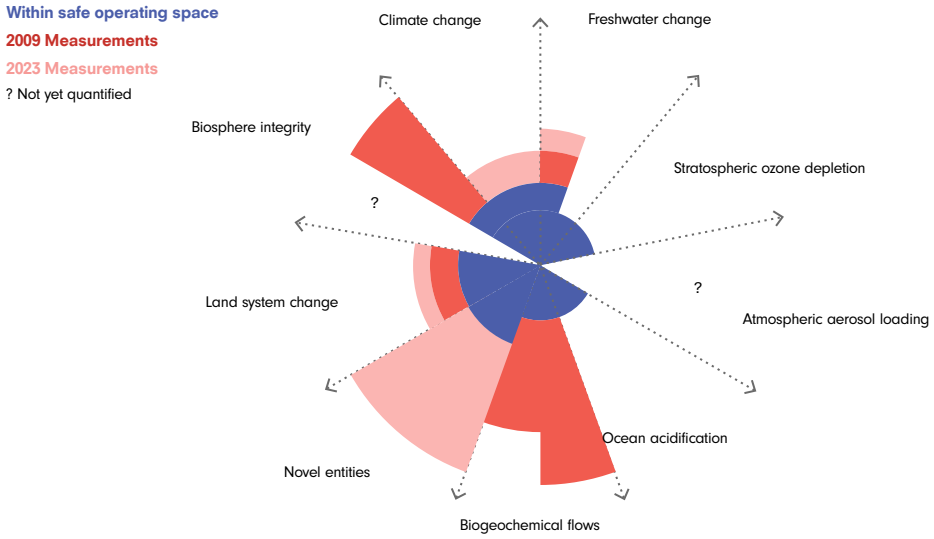
Most current pledges and commitments for climate action only represent incremental change and siloed innovation, providing a false narrative on the required interventions.

They are inadequate to address the intersectional nature of the challenges that we face and do not allow for the scale and speed of inevitable transition.[38]

We must re-frame both the context and challenges as we seek to identify future pathways.

Most of our current pledges and commitments for climate action only represent incremental change and siloed innovation, leading to false narratives on solutions.

Most of our current pledges and commitments for climate action are wholly inadequate to address the intersectional nature of challenges we face



Without systemic redesign, we will be unable to remain within Planetary boundaries

ILLUSTRATION 6: Changes in relation to planetary boundaries, with measurements from 2009 (red) overlayed with measurements from the 2023 (pin) and safe operating zones (purple). Visualisation by Dark Matter Labs based on (Illustration source 7 on page 43)

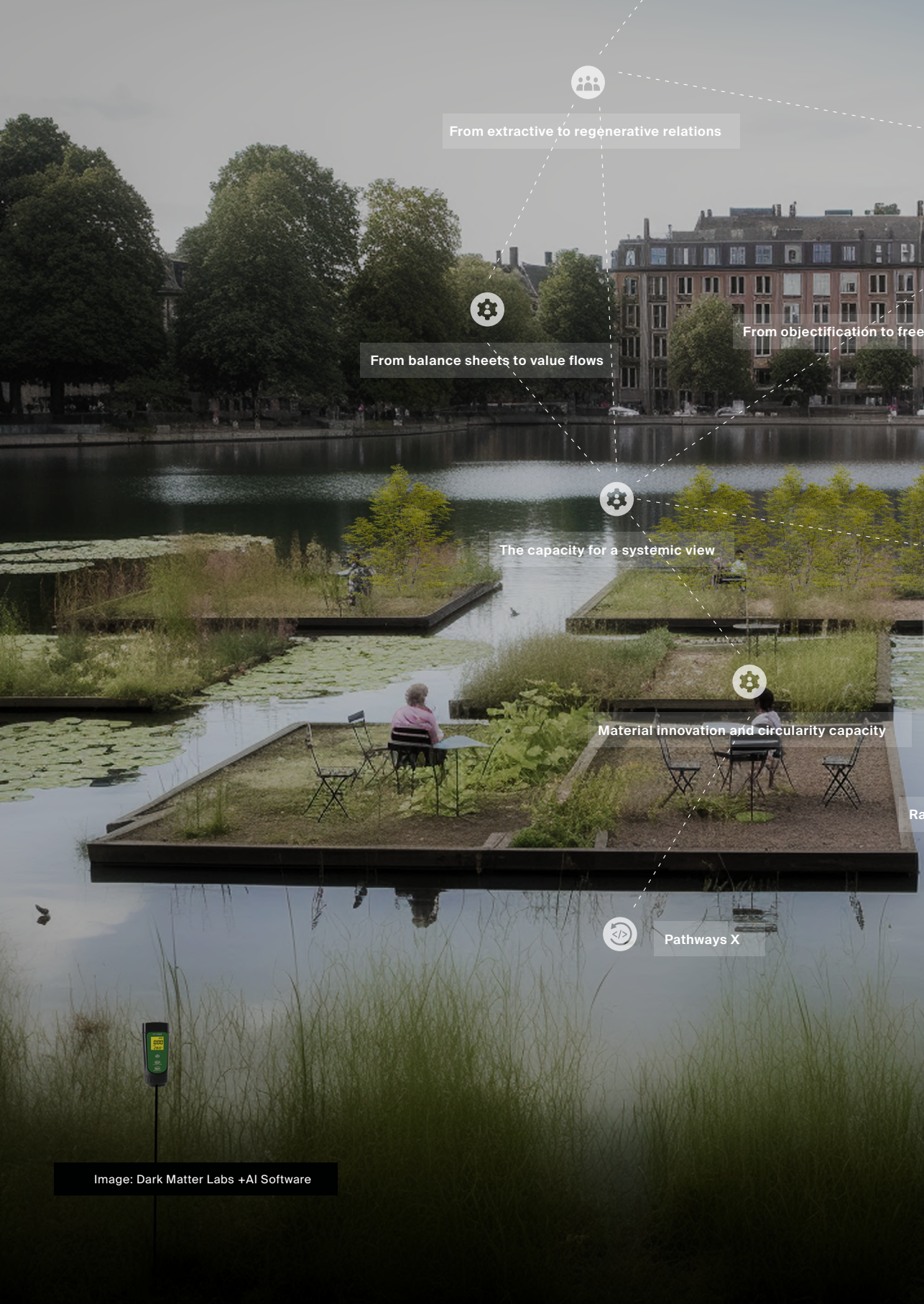
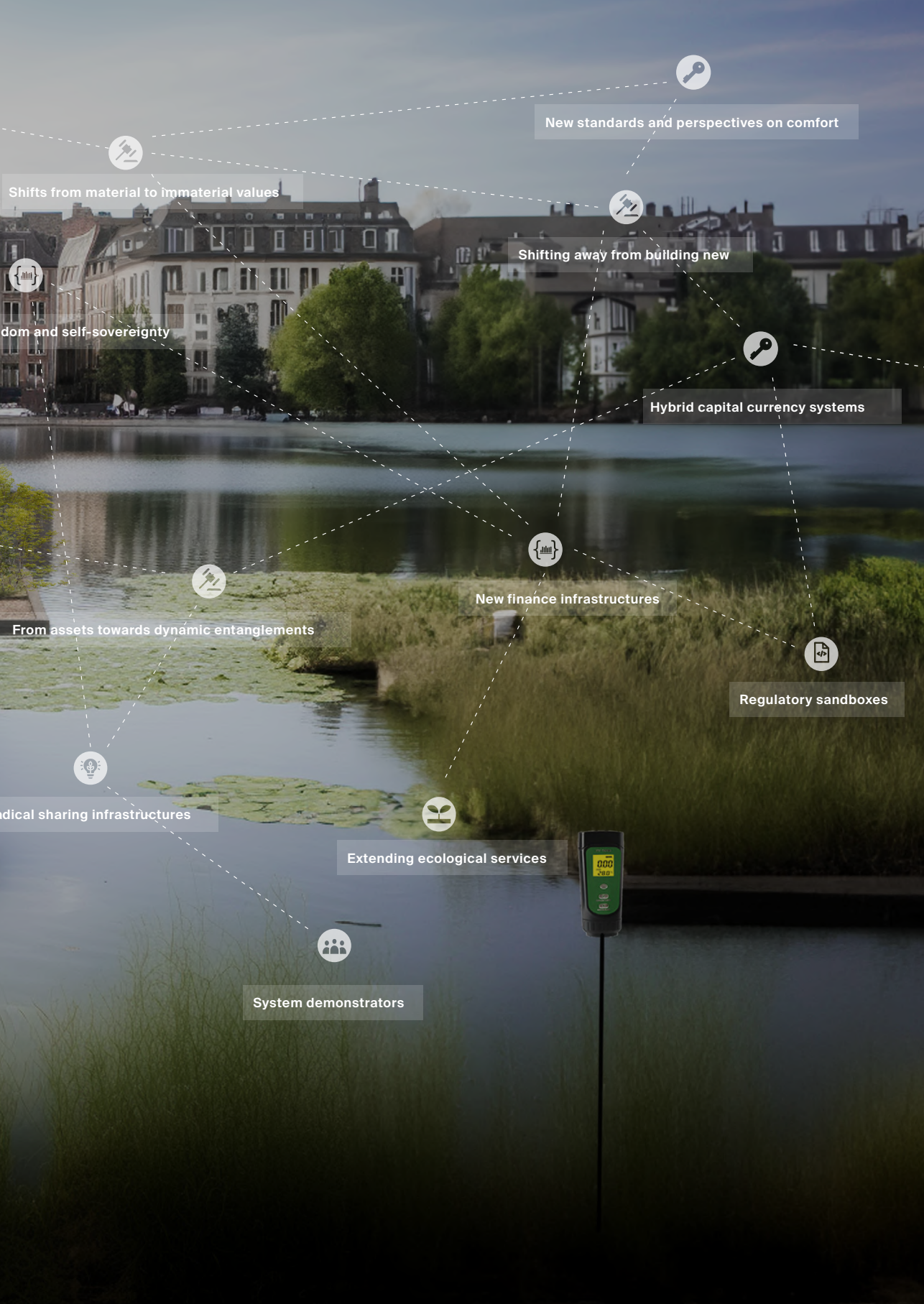


Image: Dark Matter Labs +AI Software


New standards and perspectives on comfort
Shifts from material to immaterial values
Shifting away from building new
dom and self-sovereignty
Hybrid capital currency systems
New finance infrastructures
From assets towards dynamic entanglements
Regulatory sandboxes
dical sharing infrastructures
Extending ecological services
System demonstrators

3. Foundational shifts

We face a foundational transition. This will shift us from an age defined by reliance on and abundance of fossil fuels to one in which we will experience constraints on mineral resources and energy.

A new economy could account for hybrid models of use, zero waste, circularity, the sharing of finite critical resources and the deployment of regenerative, bio-based and non-invasive materials. Rather than being based on ownership and control, such an economy could be founded on care, stewardship, radical creativity and innovation capacities.

3.1. Shift from the material

The above described foundational shifts in our built environment require us to substantively dematerialise our economy.

Degrowth of our material and energy economy will be a necessity, at least in the short term, to move away from the current trajectory of emissions, biodiversity damage and planetary injustice. This reality, aided by the promotion of maximum durability, full circularity and reusability as well as the use of super lightweight materials, biogenic, fully biodegradable and compostable materials might give us a pathway to the future.

3.2. Shift to the immaterial

As we face up to material constraints, we'll need to discover new immaterial abundances. The degrowth of material, energy and extraction could be accompanied by a growth in care, maintenance, participation, collective intelligence, new forms of logistics and virtual, augmented and other immaterial assets. To accomplish this will require investment in intangible, immaterial infrastructures.

Further, a constrained material future will also require us to accelerate growth of a civic economy encouraging new forms of radical sharing, creating new pathways of abundance through this sharing.

As we face up to material constraints, we'll need to discover new immaterial abundances.

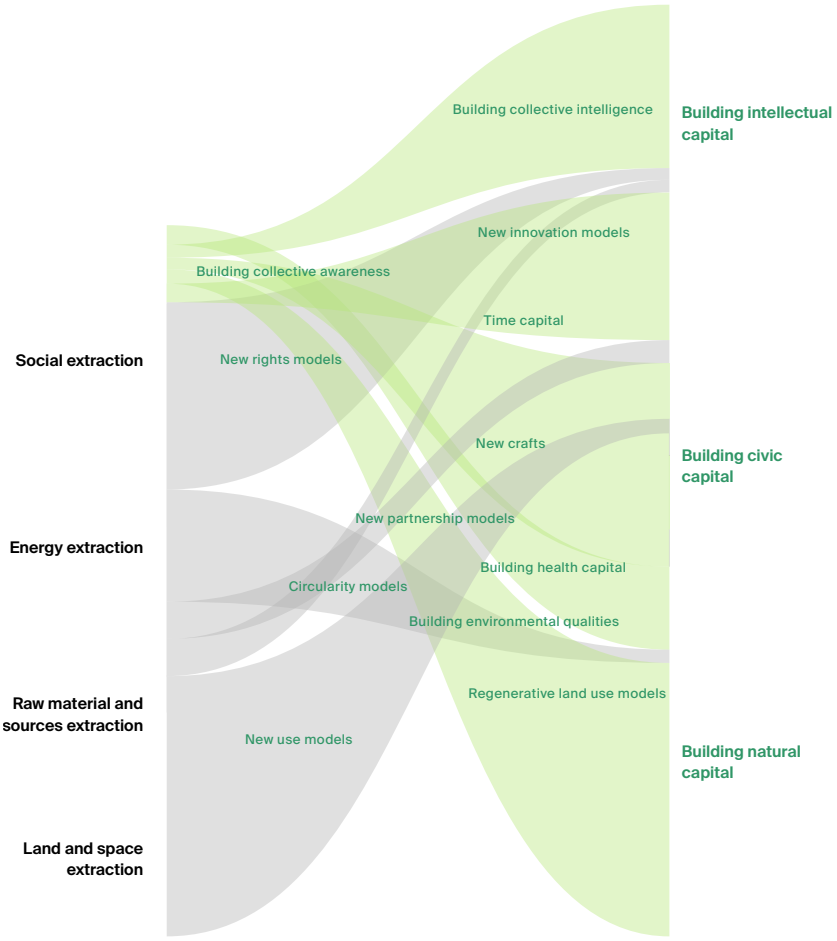


ILLUSTRATION 7 by Dark Matter Labs, The degrowth of material, energy and land extraction must be accompanied by the growth of care, participation, collective intelligence, new forms of logistics and virtual, augmented and other immaterial assets.

3.3. From extractive to regenerative relationships

This future will require us to focus on the formation of new regenerative relationships with the world around us, affecting how we relate with nature, soil, water, space and time. There is a need to recognise our co-habitation of this planet and the power of intense biodiversity in building our regenerative systems in practices of farming materials or nutrients.

As humans, we will need to recognise the sharing of resources, materials and spaces with other species and fluidity in how we use them, prompting a shift towards ecological relations, the growth of biodiversity and environmental values and acknowledgment of the importance of *One Health*[39] in the very deep codes of our institutions' economy.

3.4. From assets to dynamic agencies of entanglements

Our understanding of value should recognise the primary importance of dynamic and entangled relationships rather than being founded on notions of assets and ownership.[40]

For example, a natural body, such as a river, should be seen from the perspectives of multiple stakeholders, including the people, fish, animals and vegetation that depend on it.

Similarly, a house can be understood not just in relation to the people who live in it, but in terms of the goods and products that flow through it, the nature, animals and vegetation that surround it and the water and energy flowing through it.

We need to shift how we perceive the complexity of value flows. We can no longer abstract vitality into lifeless debits and credits in our accounts. Instead, we must find ways to represent both aesthetic and functional value.

The conception of wealth could be centered on the health of the biosphere and its nested ecosystems, with regenerative efficiency replacing profit as the primary token of optionality.

Value can be appreciated in terms of entanglement rather than distinctions between private and public goods. Consider, for example, a city's tree canopy, its collective intelligence, cooling and heating capacity, the material stewardship chains that serve it and the theory of security that protects it.

Our understanding of value should recognise the primary importance of dynamic and entangled relationships rather than being founded on notions of assets and ownership

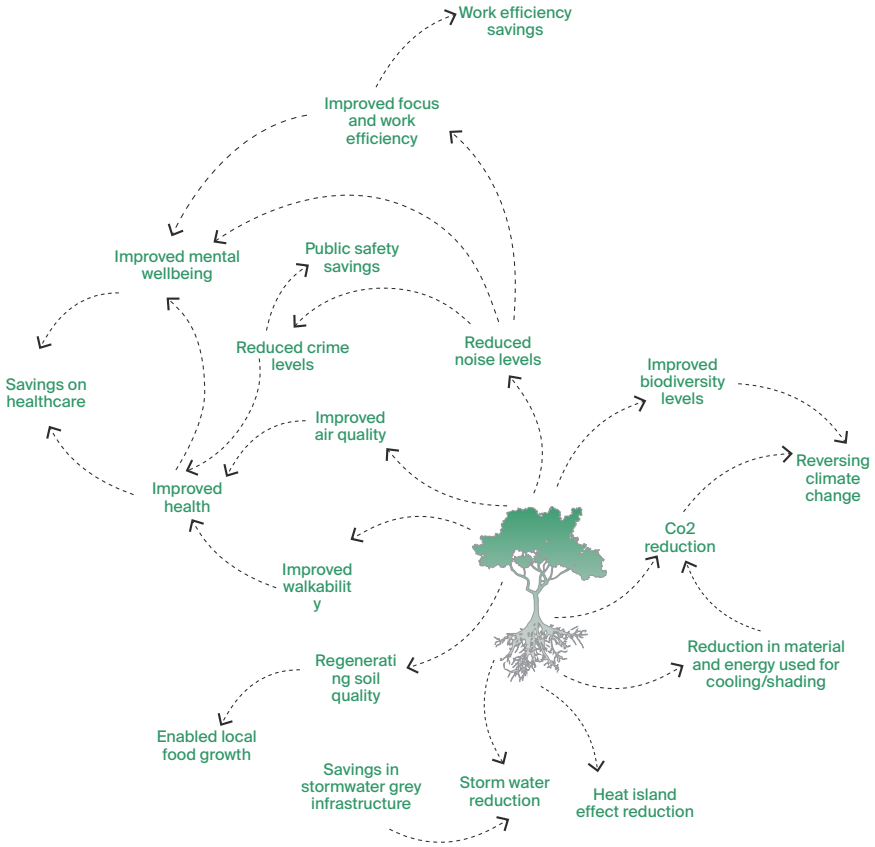


ILLUSTRATION 8 by Dark Matter Labs, Using a tree canopy as an example, there is a shift towards seeing the world through multiple stakeholders and multiple capital outcomes

3.5. From objectification to freedom and self-sovereignty

Property is foundational to our societal institutions, our economic means of production and our pathways to individual freedom. Dominant property models have contributed to extraordinary scales of harm, relating to the world through forms of objectification, separation, ownership and dominion.

Our current relationship with property is failing to balance freedom of rights with the burdens of responsibilities, especially when consequences fall on the social and ecological commons. It is clear that property rights are intrinsic to the many planetary challenges that we face, enabling the privatisation of value extraction, normalising its consequences and reinforcing inequalities that arise from the monopolisation of scarce resources.

Rather than simply fixing these imbalances, there are more fundamental questions to address.

Do property, ownership and hierarchies of control present a viable framework for planetary transition?

How do we reimagine notions of dominion and separation, replacing them with that of collectiveness, care, mutuality and reciprocity?

How can we resist the objectification and commodification of life?

Can we start recognising the self-hood and agency of everything, from flora and fauna to water systems, minerals and land?

3.6. From balance sheets to value flows

We will need to re-learn how we look at the world, not through objects, assets and liabilities but through flows of value.

Consider the example of a kitchen table. Lumber derived from trees nurtured by the soil is subjected to processing and transportation before becoming a table used for eating, playing, drawing and work. The table is intrinsic to numerous social, economic, cultural and emotional value flows.

Over time, the table may enter different homes with different value flows, or it will be

We will need to relearn how we look at the world, not through objects, assets and liabilities but through flows of value

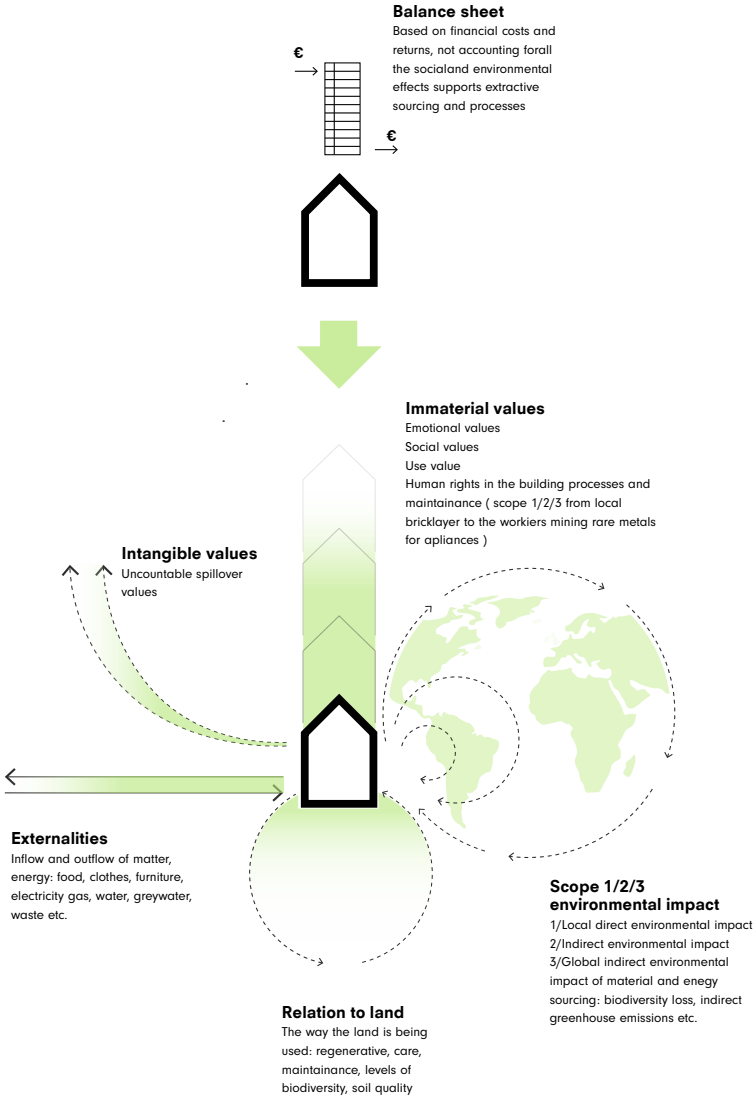


ILLUSTRATION 9 by Dark Matter Labs, Shift in seeing the world not through assets and balance sheets, instead as entanglements and value flows, on an example of a house

recycled and transformed into materials for new tables, chairs or paper. In turn, these will eventually be composted, returned to the soil and transformed into new value flows. Viewed in this way, we can see how our material life cycles are increasingly critical.

3.7. Hybrid capital currency systems

Money was once described as the alienated ability of mankind.[41] Today, we require a new form of monetary ability. Accounting for entangled goods will require us to operate through a multivalent currency system.

A tree planted by a community, for example, has a 90% chance of survival while a tree planted by a local authority has only a 50% chance of survival. The role of community can be equally effective in other scenarios.

Neighborhood care for the elderly and for children could be operated through static paid services such as those provided by homes for the elderly, kindergartens and caregivers.

Alternatively, there could be a hybrid capital system in place where elderly play with children in shared communal living rooms, while the food is cooked and shared equally, reducing food waste, energy consumption for heating and cooking. This could also help reduce the loneliness of the elderly and the stress of the middle-aged. Hybrid currency systems have the potential to change our theory and practice of value.

3.8. The capacity for a systemic view

Our first projection is that the New Bauhaus economy will need to emerge at the intersection of the various shifts we have identified above.

We will probably need to build the capacity to oversee and operationalise this economy as an entire portfolio of innovation across domains, such as: introducing green infrastructures in the form of tree canopies, civic infrastructures such as care networks and integrated financing focused on value flows rather than individual products.

Our first projection is that the New Bauhaus economy will need to emerge at the intersection of various shifts across domains of the system.

Policy innovation

Redefining standards of comfort

A-programmatic regulations

New fiscal policy to incentivize material utilization rates

Warranty and insurance contracts for supporting material reuse

Digital infrastructure innovation

Stewardship leases/tenures/contracts

Property shared ownership, stewardship registries

Natural Assets registries

Whole city material registries

Self sovereignity registries

Operations of the city

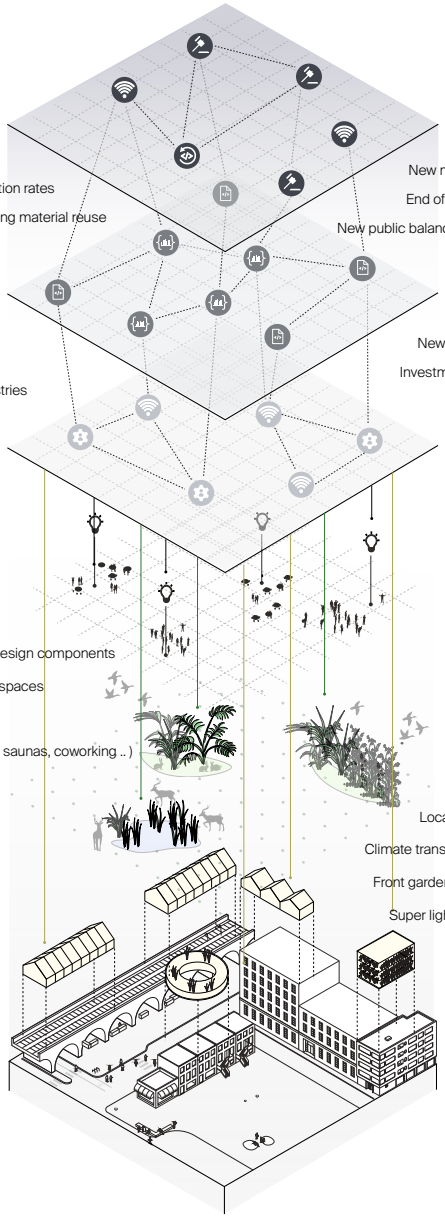
Local zero carbon transport networks

Demountable and super flexible / adaptable design components

Fluid space use, dynamic changes in uses of spaces

Public spaces used for production and work

New types of shared spaces (street kitchens, saunas, coworking ..)



Economy innovation

New models of quality assurance and certificating

End of Life sinking funds for material management

New public balance sheet with integrated values assessment

Differential discount rates on materials

Land restoration sinking funds

Circular financing

New roles and jobs, new curriculum in education

Investment in Local zero carbon transport networks

Carbon treasuries

Physicality of the city

Nature based infrastructures

Local material storage and dismantiling facilities

Climate transition knowledge hubs and impact civic hubs

Front gardens and back gardens as ecological reserves

Super lightweight constructions, rooftop construction

New bioregional forests and urban farms

Biobased retrofit of existing buildings

ILLUSTRATION 10 by Dark Matter Labs, Various shifts and a portfolio of innovation across domains of the system

4. Pathways

Acknowledging foundational shifts will inform conversations about how to collectively develop pathways that bring these changes to life. In this chapter, we will suggest viable options.

Our intention is to expand and refine this list following further research and dialogue.

4.1. Pathway 1: New standards and perspectives on comfort

Reimagining comfort in the 21st century new Bauhaus economy requires us to firstly recognise we are complicit in the vast injustice of comfort, driven by a stream of micro violences in our everyday lives: noise pollution, air pollution, light pollution, detachment from our natural ecosystems and habitats.

Further, we have to acknowledge how we achieve comfort for some in the built environment through the significant allocation of services and technologies places great demands on energy and materials, generating significant waste and impacting current and future, human and non human generations.

We will need to both change how just comfort is achieved and delivered and reexamine the actual provision of comfort for the 21st century.

As an example, this may include a radical reduction in the investment in our building, such as from space heating and overly insulated buildings towards electric heated clothing, heated furniture surfaces, sharing of heated spaces such as community living rooms, reducing the amount of energy used while delivering high standards available to everyone.

How to collectively develop pathways that bring these changes to life ?

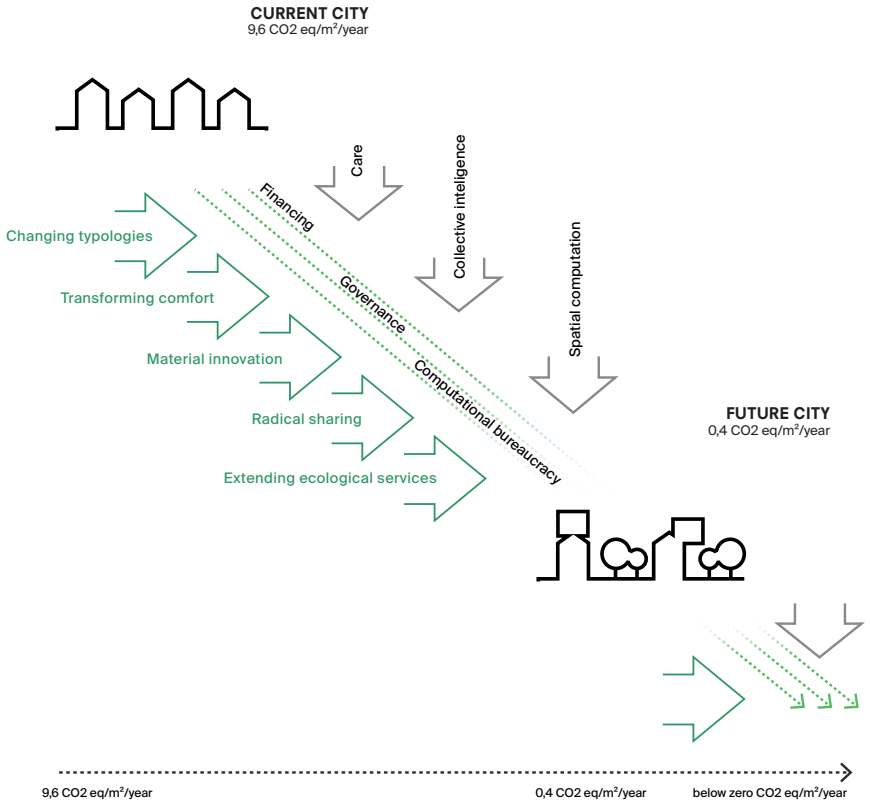


ILLUSTRATION 11: by Dark Matter Labs, An example of possible pathways toward a future regenerative human habitats

4.2. Pathway 2: Shifting away from building new

Instead of developing new buildings and new neighborhoods we will need to extend the reuse of vacant spaces, adaptive reuse, lightweight rooftop extensions, retrofitting, building on former industrial areas and parking lots. We need to fundamentally shift the basis of the regeneration of our cities from large-scale redevelopment to micro massive renewal.

We will need to increase the efficiency of our use of existing real estate. For example, right now 18% of European dwellings are vacant and the utilisation of schools is some 25%.

We will need to find new ways to use existing space and public space, reducing the need to create new spaces. This is a future which can also be encouraged and incentivised through increased taxes on unused private spaces.

4.3. Pathway 3: Radical sharing infrastructures

Further, operating in a materially constrained future requires us to imagine and build new economies focused on how we incentivise towards radically sharing our spaces and resources. Community kitchens, shared bathrooms, co-working spaces, workshops and other facilities could reduce the scale of homes, remove operational redundancy and deliver luxuries accessible to everyone.

Spaces can be deployed as platforms for temporary space use, allowing for frequent adaptation and constant use. We will also need to radically develop smart instruments for the governance and operation of common assets, such as smart social locks, automated service provision or self-sovereign sensors.

4.4. Pathway 4: Material innovation and circularity capacity

We require structural investment in building new capacities for material innovation, surgical mining, bio-design, technology, systemic learning and craft, shifting from a material extraction economy to one that combines durability, circularity and biogenity.

This is a future which will also require us to transition our labour economy, both in terms of skills and automation, addressing the implica-

tions of structural demographic shifts and the structural re-skilling necessary for this new future. We need to build a new generation of polytechnics, at the intersection of art, technology, digital manufacturing and bio-engineering.

Achieving a deep circularity may require new institutional economies such as city-scale material registries, material banks, end of life management digital sinking funds, quality assurance and certification.

We may have to develop new capabilities for storing, disassembling, processing materials and building components, shift in transport and logistics towards local and circular, design for infinite life spans and full adaptability and reuse, detoxification technologies for circular use of materials.

4.5. Pathway 5: Extending ecological services

We will need to increasingly rely on nature-based infrastructures, shifting from gray infrastructures to green and blue infrastructures which drive a multiplicity of benefits.

We will have to move away from petrochemical based asphalt, cement and plastic as main materials in our urban infrastructures; bringing re-wilded urban forests, water bodies, and permeable biogenic road surfaces into our everyday streets and neighborhoods.

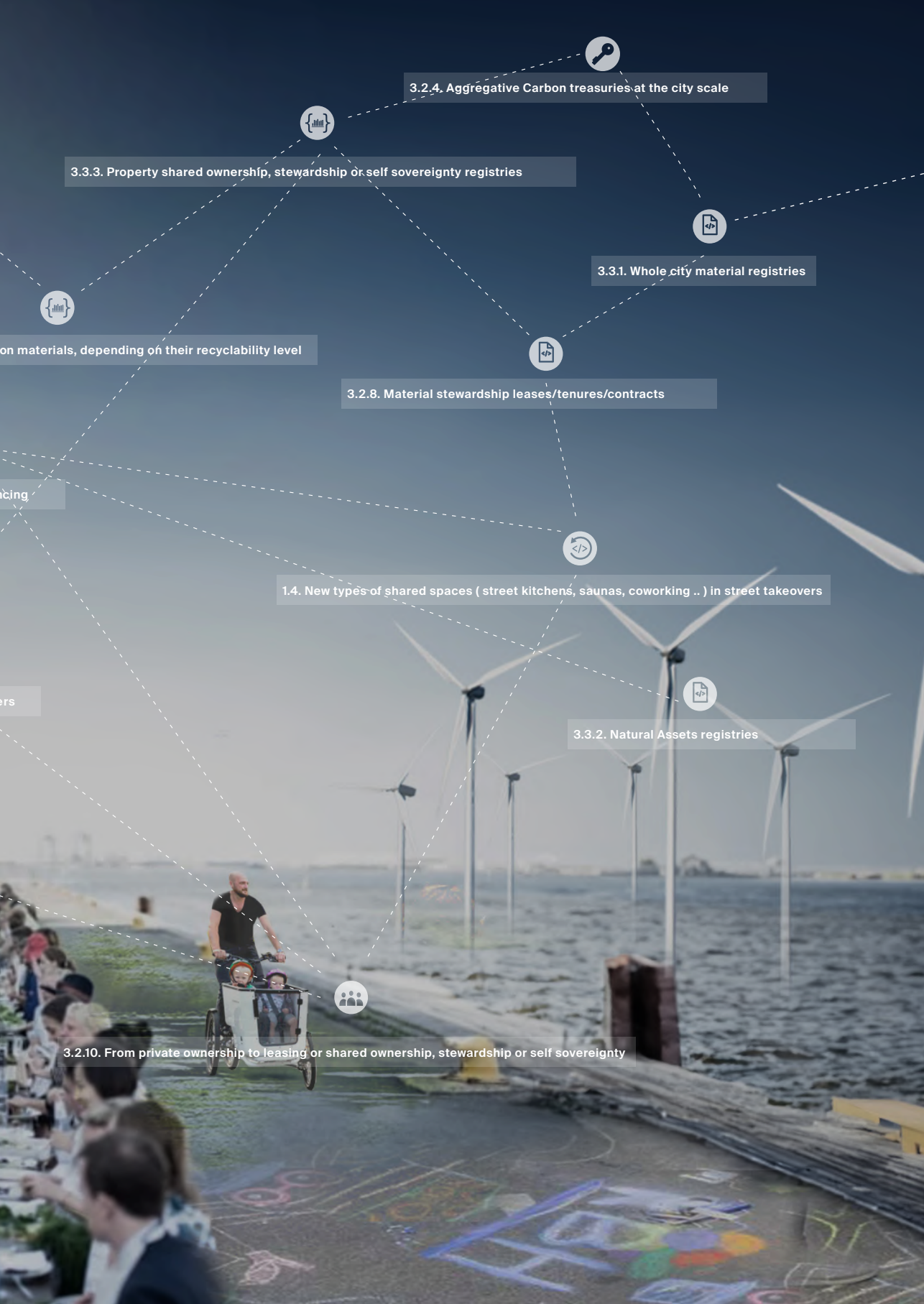
Together these are the infrastructures for enabling systemic cooling, flooding risk management, microbiome quality, neighborhood bio-digesters,material and food forests.

As an example, an accelerated development of tree canopies can significantly reduce energy and material consumption, and greenhouse emissions of using air conditioning technologies,while grass surfaces can reduce up to 20°C compared to the asphalt surfaces[42].

Further, in the associated bioregions of our cities and place we will have to foster local biodiverse material development with permaculture approaches and regenerative biodiverse land use. This will see a move away from extractive monocultures, encouraging naturally biodiverse ecosystems near to and within our cities, such as bioregional material forests supported by precision farming.

The next generation of societal infrastructure technologies will need to integrate, leverage and accelerate low-tech ecological innovation models assisted by civic data driven, machine learning.

Image: Dark Matter Labs +AI Software


3.2.4. Aggregative Carbon treasuries at the city scale
3.3.3. Property shared ownership, stewardship or self sovereignty registries
3.3.1. Whole city material registries
on materials, depending on their recyclability level
3.2.8. Material stewardship leases/tenures/contracts
acing
1.4. New types of shared spaces (street kitchens, saunas, coworking ..) in street takeovers
ers
3.3.2. Natural Assets registries
3.2.10. From private ownership to leasing or shared ownership, stewardship or self sovereignty

4.6. Pathway 6: New finance infrastructures

To finance futures at the intersection of new ecological services, collective health and materiality will require the development of new financial institutions and instruments.

Those institutions should be able to structure portfolios which are able to aggregate the positive spillover benefits, such as urban tree canopies, shared electrification networks, and sustainable modes of transport.

They will be able to invest in new forms of civic infrastructures, circular use models, collective assets and transparent stewardship models.

How do we redefine growth of our cities as an integrated value development ?

How do we build the human development investments in terms of collective intelligence, collective health, collective care ?

Cities will probably have to develop city-scale integrated value material balance sheets, end-of-life sinking funds on non-recyclable materials, differential discount rates on materials depending on their recyclability level and carbon treasuries.

This future may require new decision-making structures, frameworks for aggregating and pooling risks and benefits, valuation of unpriced risks and costs and collective balance sheets.

4.7. Pathway 7: Demonstrating the future; System demonstrators and Regulatory sandboxes

We face a future of climate crises and energy, water and material scarcity. We will need to mitigate overheating, droughts and flooding.

This is a future in which innovation cannot be siloed or addressed in the historic discrete containers, it requires innovation at the intersection of challenge and opportunities. This is a future which requires material demonstrations that drive both intersectional innovation at the level of place and support the critical system level innovations in our regulatory, institutional economies.

This is a future which will require us to reimagine and remake our very notion of how we see urban spaces. For example, the street of the future may be a shared forest, communal kitchen, co-working landscape or a community shared

energy zone (i.e. civic welfare infrastructures). It might have lightweight rooftop extension built out of bio-regenerative materials.

This might operate on a new institutional economy of material registries, sinking funds, material trusts and carbon sequestration provenance chains. It could be, for example, financed by civic perpetual bonds and operated in an environment of partial commons property rights.

How can we demonstrate these in the near future?

What is a house that owns itself, as an infrastructure of common good present and future?

What is an urban forest that functions as a temperature balancing urban element?

What is a communal kitchen that adapts to food scarcities and reduces loneliness?

How can we build place-based regulatory sandboxes which can enable prototyping and both the speed and flexibility of innovation?

4.8. Pathway 8: Computational bureaucracy

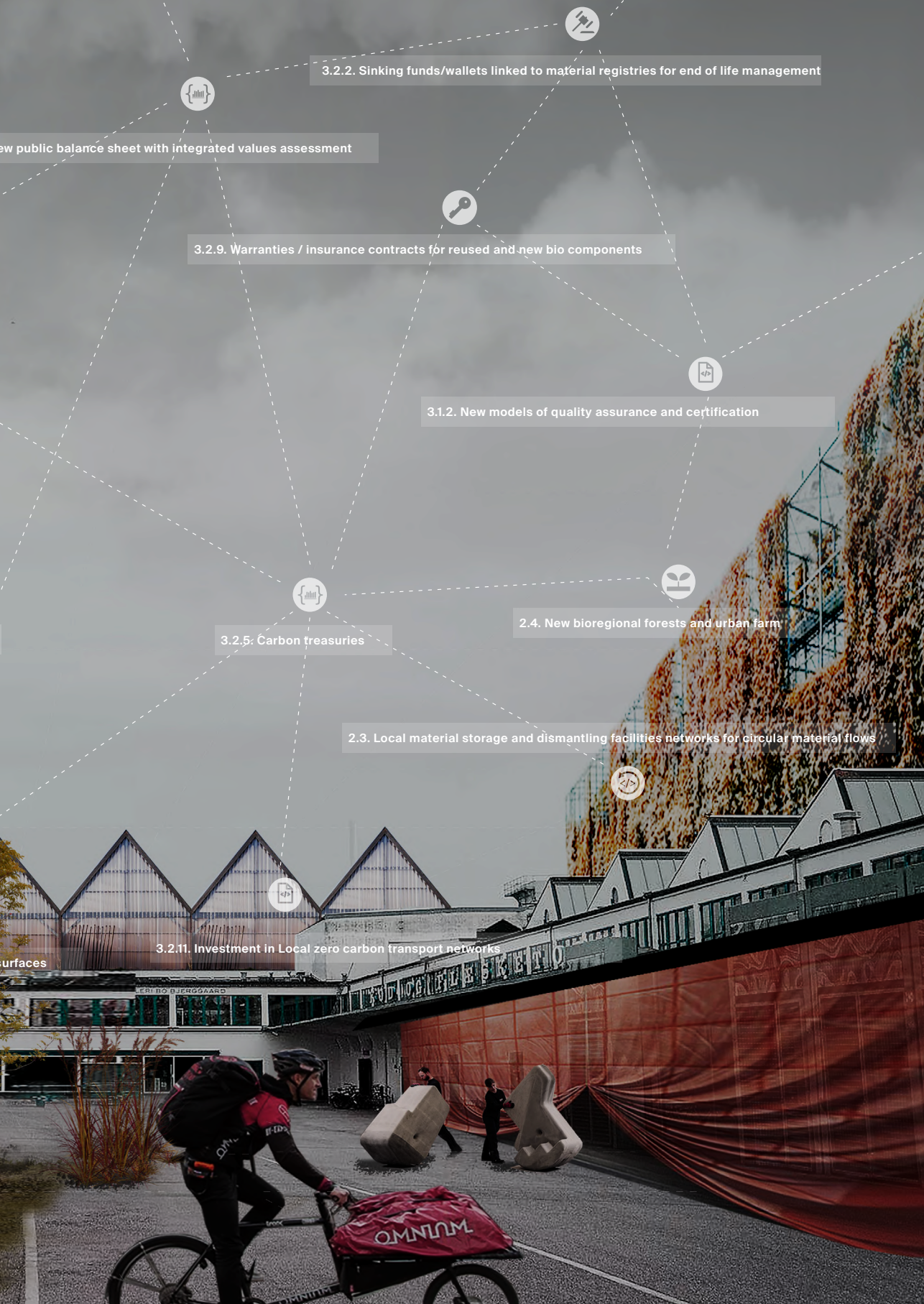
The transition could be unlocked with computational bureaucracy, a capacity for new types of operations and agency work enabling us to look at contingent reality. With this capacity to value spillover effects and shared benefits, we may gain a better understanding of value, governing it through smart covenants and other frameworks.

A machine computation economy allows us to understand and account for value across flows as opposed to value across a balance sheet. It also enables a fundamental shift in understanding and accounting for a multi-stakeholder worldview. It builds capacity for new economies of care, as well as multi-currency, multi-beneficiary frameworks.

4.8. Pathways X

The pathways we have outlined are based on assumptions and are intended to prompt further conversation. With your collaboration, challenges and suggestions, we hope to refine and develop these and identify additional pathways during the next twelve months.

Image: Dark Matter Labs +AI Software


3.2.2. Sinking funds/wallets linked to material registries for end of life management
ew public balance sheet with integrated values assessment
3.2.9. Warranties / insurance contracts for reused and new bio components
3.1.2. New models of quality assurance and certification
2.4. New bioregional forests and urban farm
3.2.5. Carbon treasuries
2.3. Local material storage and dismantling facilities networks for circular material flows
3.2.11. Investment in Local zero carbon transport networks
urfaces

5. An invitation

As the twentieth century Bauhaus sought to shift the demand and supply of the European industrial economy, we now face a similar transition in our economy. This will transform how we live our lives, what we use, what we make, what we value and how we collaborate across complexities.

It is also clear Europe has a critical responsibility to lead in the development of this post colonial, generative new Bauhaus economy, both through the transformation of the our legacies of colonialism and its historical and ongoing effects, along with leveraging our collective privilege to build a new planetary peace driven by a new regenerative material and immaterial economy.

We will require intersectional innovation capacity across the disciplines. The crafting and innovative agility of our future will fall to a new generation of polymathic teams and cross-sectoral alliances. Over the next year, we will explore how to leverage our collective force to deliver the transition at the necessary speed and scale. While it is possible to describe the shape of our future, it is increasingly clear that the real challenge centres on how to operationalise what needs to be done with sufficient urgency.

How do we demonstrate tomorrow's cities and bioregions, together with the policy, legal, regulatory, financial and governance innovation that will be required?

How do we create the capacity to make new transition markets when we have become accustomed to tinkering at the edge of the market rather than delivering structural reforms that affect the nature of the market and the meaning of value?

How do we establish the institutional and

policy logic for an integrated, multi-sector, multi-domain transition that reduces inequality and increases biodiversity ?

How do we create the next generation of financial institutions that will deliver the scale of investment necessary for transition ?

How do we simultaneously grow a super scale compound learning community ?

Defining and explaining the challenges and opportunities that confront us is a necessary first step. We then need to establish the alliances that will deliver change. This is critical to our shared future. The co-design of a pathway that will operationalise this future is a key part of the coming year's work.

While we are happy to share our thinking, we feel strongly that our work will only be robust and meaningful if we begin building on it with the wider network. This is an evolving area and we are committed to making this work a collaborative and additive contribution to the transition of our built environments.

We invite you to join us.

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A NEW EUROPEAN BAUHAUS ECONOMY
Designing our future
Invitation paper

This paper has been developed by Dark Matter Labs as part of the New European Bauhaus lighthouse project, Desire – an Irresistible Circular Society. The project is funded by the European Union.

This first working version of the paper draws on our team's preliminary research and interaction with relevant European actors. It is a collaborative and additive contribution to the New European Bauhaus movement.

The paper will be developed over the course of the next twelve months with a series of in-person and online engagements.

This version presents a 'straw dog' that can be tested, iterated and dismantled over the course of the year. We welcome your criticism and verification of our analysis and projections. We hope that together we can strengthen and improve what is set out in the following pages.

A final version of the paper will be launched at the New European Bauhaus Festival in Brussels in April 2024.

The paper has been developed by Indy Johar and Ivana Stancic, with valuable inputs from Emily Harris, Jayne Engle, Martin Lorenz, Oliver Burgess and Zehra Zaidi from Dark Matter Labs.

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Names are listed in alphabetical order.

desire an irresistible circular society

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