

TOWARD RE-ENTANGLEMENT: A CHARTER FOR THE CITY AND THE EARTH

Convened in Rome, 08 June 2022

A CALL TO ACTION

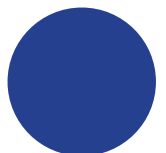
This is a call for radical and immediate action. It is a call for the healthy and regenerative re-entanglement of human activity with the Earth's natural systems; a call to dismantle the conceptual, commercial, and technological barriers that blind us to the environmental impacts of our own consumption; to engage human ingenuity and creativity to reimagine the act of building and dwelling, and to re-form the cultural and industrial processes they engage and the material artifacts they generate.

The production and operation of buildings must benefit both the human species they house and all other living organisms and those biomes that are their home.

The history of humankind has seen the accelerating urbanization of the planet, a process reliant on increasingly mechanistic economic models that propagate the relentless extraction of dwindling terrestrial resources. This in turn has severely distorted the Earth's natural systems and put at risk the future of humanity, our fellow organisms, and the planet as we know it.

Human settlement, in its most dense manifestation, the city, is our most durable yet ever-evolving cultural artifact. It is a center of innovation but also a primary consumer of material and energy. It is a source of economic power and opportunity but also a site of social inequity and deprivation. It represents the materialization of human community while driving isolation and disenfranchisement. A symbol of human vitality, the city obscures and suppresses the signals of systemic alarm that only nature can provide us. We recognize its profound vulnerability: as a symbolic and strategic target in times of military conflict, as a vector of epidemic, and as a casualty of the kinds of future shock and stress that the collapse of natural systems will inevitably trigger.

Change, therefore, must start in the city and extend to the regional ecosystems that sustain human habitat. This change must happen with deep respect for the resources we use and in



close synergy with rural communities who have been ignored by current economic models, but whose traditions, knowledge, and experience will be critical to our—and our fellow species’—survival.

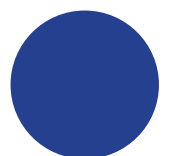
We need to rethink and rework the material, means, and methods with which we build our cities, and the way we organize, occupy, and maintain them. We must forge new social and economic values that inextricably tie human activity to ecological restoration, and that expose and embrace the symbiosis of upstream environmental health and our downstream vitality and equity.

Today, fifty years after the Club of Rome’s visionary report, “The Limits to Growth”, anticipated the emergencies we now face, we reconvene in Rome to catalyze immediate and radical action. The challenge is daunting, but our ability to transform our global environment is proven. The time to act is now!

(Our only limit is our will to do so).

WHY WE MUST ACT

Our species, and the terrestrial resources and systems on which we rely, have reached an existential tipping point. The contemporary building sector has become the most significant source of anthropogenic environmental disturbance, while failing to meet the basic needs of the global populations who continue to live in impoverished and undignified conditions. By nearly all measures, the tenets of sustainability and the contradictory aspiration of sustainable growth have proven incapable of delivering any of the putatively interlinked benefits of social equity, environmental preservation, or economic feasibility. The dire environmental and social consequences of our current materials, means, and methods of housing humankind reach far beyond building walls and city limits to threaten our planetary boundaries. The unregulated extraction and consumption of increasingly critical resources; a geologic stratum’s worth of processed material and discarded waste layered on our earth’s surface; the industrial conversion of biologically rich land and the decimation of healthy ecosystems that once thrived there; the alarming increase in the atmospheric concentration of greenhouse gases and poisoning of the earth’s soils and waters.— these are the legacy of homo faber.



By 2050, 2.5 billion new inhabitants are predicted to populate cities across the world, doubling the projected demand for new building construction and tripling the land area we will consume in the process. If current practices continue, this will further shock our already weakened terrestrial systems. It will lead to a spike in concentrations of greenhouse gases in our atmosphere, a glut of waste byproducts, and the significant degradation of land and marine biomes that are our only source of resilience. As these ecological and climatic imbalances grow, so will the social and economic stresses that global disequilibrium induces. Migrating populations will flow from sites of scarcity to regions still rich in resources, straining political systems and exacerbating strife.

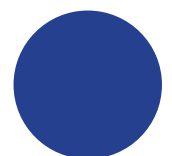
We acknowledge the many environmental and socio-cultural agendas proposed and ratified in recent years and we note their contributions to this very call to action. We choose to address, however, a subject largely neglected by discourse and with unrecognized significance in human-kind's ongoing transgressions of planetary boundaries: the conception, production, operation, and disposal of buildings and cities, the resources exploited, the inequity and disfunction perpetuated, and the waste compiled throughout the process.

As the designers and builders of our constructed environments; the stewards of our natural systems; the aggregators of material and energy that sustain our buildings and cities; the makers of building products, assemblies, infrastructures; and the scientific investigators who assess the implications and impacts of our building activities, we accept our responsibility and acknowledge our agency in restoring the terrestrial health and well-being of our planet, through the making and maintenance of buildings and cities.

The future is our Commons; only in committed solidarity can we save and restore it.

WHAT WE MUST DO

We must respond to today's unprecedented crises by embracing them as an opportunity to redesign our cities, not only the physical objects that comprise them, but the entire life cycle of the urban environments we construct. The future cities we must envision (and ultimately build) must incorporate our careful management and revitalization of the biological resources we draw upon. They must make creative use of industrial and consumer waste and apply it to the retrofit, adaptation and upgrade of our building stock and the multiple life cycles of reuse that cascade from it. As both producers and consumers, this



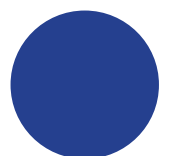
metabolic approach to building is our agency and our means to tackle the grand challenges of our time: social inequality, climate change, biodiversity loss, and human health. The sheer mass of material we must inevitably extract to construct these human habitats; the land we will consume; the size and makeup of the workforces we will engage to meet the demands of those new citizens we seek to house; the ecosystems we will shape in the process — all these serve as both motivation and means to rethink our cities and their relationship to the regions that surround them, and the ecosystems that offer us potentially renewable natural resources and services. These principles, properly understood and applied, within specific regional, eco-systemic, and cultural contexts, must guide the re-design of the shared spaces, buildings, and infrastructure that comprise them:

1. INVEST IN NATURE

Nature is the existential infrastructure of life on earth—including human life—and the only solution to heal the planetary crisis. We must seek out, learn from, and invest in the profound intelligence and enduring lessons that a healthy biosphere can offer us. There can be no investment in cities — whether intellectual, spiritual, political, social, or economic — without a corresponding, coordinated, and continually renewed investment in the natural systems that surround and suffuse them. Without an inextricable and enduring alliance between urbanity and nature, the concepts of energy efficiency, carbon neutrality, human health, economic vitality, and environmental sustainability are meaningless. Eco-systemic well-being, which includes humanity but is not limited to our species, must be understood as a basic right of all citizens and the organisms that contribute to the health of our terrestrial metabolism. Integrating natural systems such as forest, grass- and wetlands, and marine biomes into cityscapes is essential for human health and wellbeing. These are the systems that draw down excess carbon dioxide, absorb and cleanse the stormwater runoff of our streets, shade our homes and our urban meanderings from the heat of harsh sunlight, infuse our dwellings with reoxygenated air, protect buildings from the ravages of wildfire and flooding, and remind us of our embodied relationship with our fellow species. Far beyond the tattered perimeters of our urbanized landscapes, the systemic benefits of nature accrue rapidly across vast timescales and geographies.

2. EXPAND THE SYSTEM BOUNDARIES OF DESIGN AND GOVERNANCE AND THE TEMPORAL AND SPATIAL SCALES OF OUR AGENCY

Neither buildings nor cities are closed systems. They are, instead, in a continuous negotiation of energy and material with their immediate sites and broader hinterlands. We must



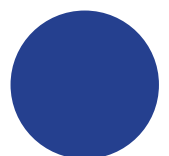
marshal human experimentation and innovation—and the collaborative economic enterprises that may arise from them—to drastically limit negative impacts and embrace systemic, trans-scalar, and cross-sector environmental benefit. With each constructed element we conceive—from a structural component to an urban district—we must design not just its form but its full life cycle. With each material, assemblage, or city block we imagine and implement, we must discipline our demands to reflect the capacity of our regions to supply it, to acknowledge and adapt to scarcity, and to respect — and even celebrate — those constraints. Bio-regionality, the remapping of jurisdictional boundaries to reflect a region's natural ecological function, must replace the artificial divisions rooted in political affiliation that have prevented the effective governance of our environmental resource and the ecosystems that are our natural infrastructure.

3. ENHANCE RATHER THAN DEplete BIODIVERSITY

We must thread sensitive and synergistic loops of feedback through our source ecosystems and the urban supply chains that pull on them. When we strip land of life-giving soils, flora, and fauna, or extract ore and minerals from the geological sub-strata to form our cities, we disable the essential and productive biological capacity of the earth. Every existing disturbance to ecological systems—except the blind extraction of material and energy for short term gain—represents an opportunity. By valuing biodiversity and embracing the range, complexity, and constructive potential of our natural landscapes, we can supply renewable materials and services for our cities, while improving the health, diversity, and expansion of those same natural systems. Rather than demand that forests produce certain prized-grades or uniform species with which to build, we must instead ask what forests can naturally provide while maintaining their inherent biodiversity. In place of destructive over-farming or the filling of wetlands for suburban expansion, building and agriculture can serve to restore soil and regenerate habitat, while enlightening our interaction with the landscapes we once abused. In addition to eco-systemic restoration, this optimized relationship with nature allows critical habitats and ecosystems to remain wholly undisturbed and transforms our cities from predatory consumers into regenerative forces for nature.

4. SINK CARBON BY CONSTRUCTION

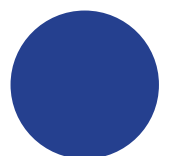
We can transform cities from climate culprits into carbon banks, offsetting the significant lifecycle impacts created by their greenhouse gas emissions. If constructed and maintained with regeneratively sourced and renewable, bio-based materials—timber, bamboo, plants, and agricultural waste products—buildings, infrastructures, and entire urban systems can



reliably store significant amounts of bio-genic carbon. Where plant cellulose can replace the energy- and emissions-intensive classes of mineral-based and petrochemically-synthesized materials such as concrete, steel, and plastics; when we can deploy biomaterials at the scale of cities, over repeated cycles of recovery and reuse; and where those plant fibers flow naturally from the yields of ecological silviculture or community-based regenerative agricultural activity, they can form massive and durable urban carbon sinks. By forging biological value chains that incentivize the protection, restoration, and expansion of global forests, we also create opportunities for meaningful and dignified rural employment. Meanwhile, those sustainably managed source forests will continue to absorb more atmospheric CO₂ in future cycles of natural (and, where necessary, enhanced) regeneration. Where bio-genic materials and processes cannot be applied to a cities, buildings, and infrastructure, we must strive to continually decarbonize and optimize manufacturing processes, while seeking to minimize—and ultimately re-use—the number of carbon-emitting materials we use.

5. CAPTURE NATURAL ENERGY RATHER THAN EXTRACTING FOSSIL FUELS

Our buildings and cities, and the sub- and ex-urban landscapes that emanate from them, are net energy consumers. In our technological zeal to invent elaborate mechanical systems to manage the quality and temperature of our air, we have failed to observe the abundant benefits of nature and the eco-systemic services it can offer us. Rather than learn from natural physical, chemical, and biological phenomena, we continually attempt to refine dysfunctional and rapidly obsolescent technical facsimiles. We have yet to take full advantage of the potential active and passive thermodynamic exchanges and energy generation associated with the vast surfaces we have arrayed across our constructed landscapes. The particular properties of the material that comprise them — their density, reflectivity, chemical composition, even color — may serve as media for energy exchange, rather than the source of overheated urban corridors and spaces. Building walls and roofs must be reconfigured to optimize solar orientation and radiation and facilitate its transformation into useable energy. Foundations and structural walls can serve as thermal mass to sink excess heat or cold and serve as media for heat exchange. Coupled with the reduction of production stage energy consumption, these lifecycle strategies may offset the loads of sectors unable to meet their own energy demands. Through the creative reimagination and reconfiguration of material applications, and the careful layering of building and infrastructural assemblies, we may supplant our reflexive focus on engineering mechanical heating and cooling equipment and redirect squandered heat energy as a means to temper urban dwelling. Through



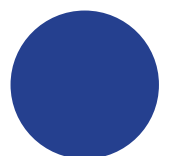
the careful planting of trees to provide shade, the reintroduction of urban greenways and -spaces to absorb UV energy and reduce surface albedo, by threading re-naturalized waterbodies through our urban fabric to enhance evaporative cooling, we can reduce the heat gain in our public spaces and cooling requirements of our homes.

6. QUESTION WHY WE BUILD AND WHAT WE BUILD WITH WHILE
PRIORITIZING THE REUSE OF EXISTING BUILDINGS AND MATERIAL

Rather than assuming the solution to any urban building need is the extraction, processing, and consumption of virgin raw material to construct new buildings and infrastructure, we must stringently re-evaluate (and creatively re-value) what we have already made. By siphoning off-waste streams from industrial and consumer activity in the repair and retrofit of existing structures, we can create new, value-added processes that transform discarded and devalued matter into new forms of “raw” industrial material while revitalizing our urban habitats. When we promote circularity through multiple cycles of material reuse and embrace the repair, maintenance, and upgrade of our current building stock, we avoid a whole new set of environmental burdens, ecological disturbances, and the social dislocations they entail. Our critical assessment of the very premise of new building must accompany a rigorous analysis of the materials and spaces we truly need. These fundamental reflections and subsequent analyses must precede any refinements in technology and efficiency that have become the reflexive response of the global building sector’s current approach to “sustainability.”

7. BUILD DENSE AND POLYCENTRIC CITIES TO RESTORE URBAN
COMMUNITY AND REGIONAL WILDLANDS

Cities, when convivially organized and clearly bounded, are inherently efficient organisms. By reigning in their spatial extents, we avoid the conversion of biologically productive land into sprawling, infrastructurally attenuated, automobile-oriented hardscapes. Instead, we can optimize land already assigned to the urban sphere and thereby instill in it more profound value. Dense, mixed-use neighborhoods where citizens can live, work, and play enhance urban quality and reduce infrastructural requirements across all scales of urban inhabitation: exterior building envelopes and systems, when shared by multiple urban households, in multi-story buildings, reduce per capita embodied emissions; easy and equitable access to livelihoods, social facilities and services reduce the externalized costs and emissions of long commutes. Efficient networks of mass transport and mobility de-emphasize the use of automobiles and trucks within the city, reducing the energy consumed, the



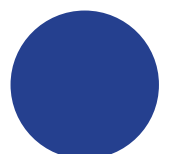
pollution emitted, and the vast area of land required. That land, in turn, can be reassigned as public pedestrian corridors, green spaces, and promote the careful restoration of natural forest, wetland and other ecologically critical landscapes. Dense and efficient polycentric cities can replace unconstrained urban sprawl, eliminate often neglected and undervalued urban peripheries, and clarify and enrich the interaction between those convivial cities and the healthy wildlands that border them.

8. PROVIDE SECURE AND DIGNIFIED HOMES FOR ALL PEOPLE TO BUILD SOCIAL EQUITY, ECONOMIC LIVELIHOOD, AND SHARED RESPECT FOR OUR COMMON RESOURCES

Housing is not merely a means of survival, a commercial product, or an investment instrument. Housing, understood as dwelling, provides homes where individuals and families can grow and evolve comfortably, within well-considered, functional, healthy, and spiritually restorative spaces. Those under-served and disenfranchised populations, who struggle for access to the bare minimum of resources and services, have become the first victims of our environmental crisis. The basic human right to dwell safely, securely, and with dignity, must become our universal objective. The making of secure and dignified homes for all is the means to meet a dire need, reduce vulnerability, build equity, and empower and stabilize individuals and households, their communities and, by extension, the resource landscapes that supply them. Stable homes, and the regenerative and equitable design and construction practices that produce them, create employment opportunities all along the building value chain and promote durable investment in people across all sectors of society. Our failure to make it so will only exacerbate social inequities and drive ever-deepening exploitation of our dwindling natural world.

9. MAKE PUBLIC SPACE THE ESSENTIAL INFRASTRUCTURE OF CITIES AND THE SITE OF SOCIO-POLITICAL DISCOURSE AND INNOVATION

Our species can only mobilize our innovative capacities, determination, and solidarity to address our existential crisis if we build strong and cohesive societies. Rather than retreating into segregated islands of difference, we should focus on strengthening and expanding the tissues of public space. Public spaces have always been the locus of local democracy and participation; places where differences are negotiated and social bonds forged, and where a sense of community and belonging can emerge despite increasingly diverse and mobile global societies. The vast network of corridors and storage spaces built for cars and industrial use that dissect our cities must be reassigned and transformed into spaces that



serve people and their needs. This is a critical lever with which we can convene societies across all generations, genders, social backgrounds, and abilities. While we acknowledge the networking power of digitalization, we believe it is the safe, walkable city and the physical, social encounters that occur there as the most effective means to promote our basic human right to participate, experiment, and reinvent – the right to live in the city.

10. EMPOWER RURAL COMMUNITIES AND ENGAGE THE TRADITIONAL KNOWLEDGE AND PRACTICE OF INDIGENOUS PEOPLES AND NON-WESTERN CULTURES

The inextricable relationship between dense, vibrant cities and the ecosystems and human settlements of their hinterlands depends on the sustaining and rewarding employment of the individuals and communities who choose to dwell there. The re-valuation of rural lives and spaces — whether tended as agricultural land or maintained as ecological preserve — is essential to overcome cultural and political antagonisms and arrest the relentless consumption and devaluation of natural systems. The deep cultural knowledge and traditional practices of rural inhabitants offer lessons and value for the regenerative management of regional ecological resources. By building on local tradition we resist the universalising force of modernity and embrace place-based knowledge. We must reapportion economic power at local, regional, and global scales by focusing on the rural communities and their sustenance, reinstate and enforce the development rights of indigenous communities where they have been suppressed to promote access to opportunity, shift established administrative and regulatory jurisdictions where they fail to meet need or effectively govern, and redistribute the responsibility for the procurement of resources and the production and management of our human habitat.

11. WELCOME NEW URBAN CITIZENS

Our unfolding climate emergency along with political conflict and economic deprivation has already displaced more than one hundred million people worldwide. In the foreseeable future, either by immediate impact or a cascade of secondary effects, climate change will render vast regions of the world uninhabitable. We must use our ingenuity as designers, builders, and policymakers to anticipate the influx of those dislocated by environmental crisis, to engineer the spatial and infrastructural elasticity that our cities will need—in political spirit and as constructed dwelling space—to absorb this new influx of people and the ideas and materials they bring with them. Cities are dynamic laboratories. They are the dense spatial settings within which a regenerative future will be imagined, tested, and negotiated.



They must offer the necessary elasticity to absorb the natural transiency of people, ideas, materials that will be necessary to cope with the dire challenges our civilization faces. They are the sites in which diversities of human aspiration, background, and vision can catalyze the changes needed to meet the dire challenges our civilization faces.

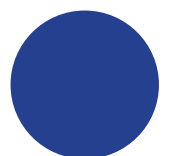
12. REDEFINE BEAUTY BY BUILDING WITH LOVE AND COMPASSION FOR HUMANS AND NON-HUMANS ALIKE

Regenerative building—the cityscapes it creates and the ecosystems it seeks to restore—will demand an unprecedented exchange of information, our collective collaboration, responsibility, and resolve, and our willingness to share and redistribute resources. If cities are to be our true catalysts for change, then they must incorporate broad awareness, appreciation and protection of the often remote and unfamiliar landscapes and species that comprise the only planetary home we know. It is an opportunity to redefine and entrench a new sense of beauty and joy in the making and experience of our buildings and cities—for the people and non-people who inhabit our Earth.

WHAT WE NEED FOR SYSTEMIC CHANGE AND A REGENERATIVE FUTURE

The trans-scalar and systemic re-formation of design and building practice— its conceptual embrace of whole building and urban life cycles and their potential impact as both fundamental and totalizing concern—will entail new realms and scales of governance, collaborative and interdisciplinary design thinking and making, radical experimentation, novel and broad-based educational initiatives and learning networks, cross-cutting knowledge management and transfer, purposeful communication and participatory action. We need to democratize digitalization to inform and manage the productive entanglement of Technosphere and Biosphere. In addition to new materials, means, and methods, we seek new conceptual approaches, languages, and modes of action with which we will re-form the artifacts and activities of the Anthropocene city.

In recognition of the dire threat of climate collapse and global mass extinction; in acknowledgement of our responsibility for the conception, materialization, and management of human habitats; out of deep concern for their irrevocable impact on the terrestrial sphere and our own species very existence, we, the undersigned, call for the systemic transforma-



tion of our expectations and aspirations, our behaviors, and our practices. We commit to the redesign of buildings and cities to re-balance our relationship with nature and its eco-systemic health.

This is our shared challenge and our shared commitment.

THE CO-AUTHORS

Alan Organschi*, Bauhaus Earth
Ana María Durán Calisto, Estudio Ao
Andrea Gebhard, German Federal Chamber of Architects
Cade Diehm, New Design Congress
Edgar Pieterse, African Centre for Cities, University of Cape Town
Franziska Schreiber, Bauhaus Earth
Guiseppa Scarascia Mugnozza, University of Tuscia
Hans Joachim Schellnhuber, Bauhaus Earth
James Drinkwater, Laudes Foundation
Marlène de Saussure, Bauhaus Earth
Marc Palahí, European Forest Institute
Monica Tanuhandaru, Environmental Bamboo Foundation
Nathalie Jean-Baptiste, Julius Baer Foundation
Philipp Misselwitz*, Bauhaus Earth
Rocío Armillas Tiseyra, Bauhaus Earth
Tilman Prinz, German Federal Chamber of Architects
Vicente Guallart, Institute for Advanced Architecture of Catalonia
Vyjayanthi V. Rao, Yale School of Architecture

*Rapporteur

An initiative of BAUHAUS EARTH.

The full version of the Charter is available on: bauhauserde.org/initiative/re-entanglement

