From Green to Sustainability: Advancing a Holistic Paradigm for Regenerative Development – Insights from European and Asian Cases[1]

Zhang Ying

(Singularity Academy, Switzerland)

Wangchuk Tenzin

(The Embassy of the Kingdom of Bhutan to Switzerland)

Häring Christopher

(Häring Group, Switzerland)

Guzy Chris

(REFIRE Group, Canada)

Ning Ning

(Xpeng Ltd., the Netherlands)

Ali Farhat

(Swiss Business Council, Pakistan)

Jaeck Claude

(Foreign Trade Advisor to the French Government, France)

Lustenberger Urs

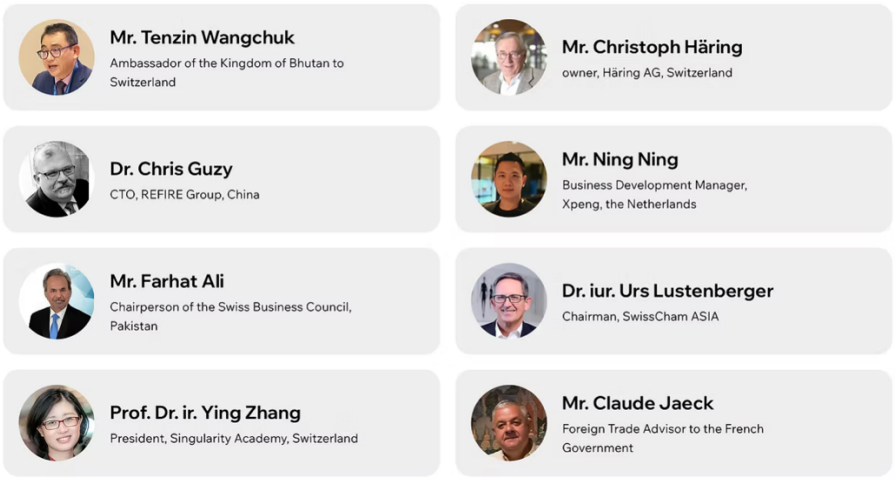
(SwissCham ASIA, Switzerland)

[1] Based on the Webinar Nov. 28th 2024 by Singularity Academy, SwissCham ASIA

Citation:

Zhang, Y., Wangchuk, T., Häring, C., Guzy, C., Ning, N., Ali, F., Lustenberger, U., Jaeck, C. (2024). From Green to Sustainability: Advancing a Holistic Paradigm for Regenerative Development – Insights from European and Asian Cases. *Singularity Academy Frontier Review* (ISSN: 2813-3641) # 20241225.

Our Contributors



(Associate Editor of this article: Muxi Liu)

Singularity Academy Frontier Review is an academic-practice peer-review journal published by Singularity Academy Publishing House. Its purpose is to promote the results of cross-disciplinary collaboration at Singularity Academy and stimulate discussion on the issues raised. The journal discusses the academic and practical aspects of sustainability, medical care, economics, sociology, law, artificial intelligence, innovation, geopolitical relationships, physics, theology, well-being, and the discovery of the universe.

ISSN: 2813-3641

Zurich, Switzerland

Thanks to the organisations below for supporting the development of the Webinar of Nov. 28. 2024

Abstract

On November 28, 2024, **SwissCham ASIA** and **Singularity Academy** convened the *"From Green to Sustainability"* webinar, assembling an esteemed group of thought leaders to critically examine the complex journey from superficial environmentalism to systemic, authentic sustainability. The rich dialogues surfaced indispensable insights into the limitations of prevailing "green" paradigms and illuminated the profound economic, political, social, and behavioural transformations required to realise a genuinely sustainable civilisation. This paper examines **four key cases**—Bhutan's Gross National Happiness Index and Gelephu Mindfulness City, sustainable timber engineering in green construction, hydrogen energy innovations, and China's electric vehicle (EV) revolution—alongside a theoretical exploration of *an ecological comprehensive framework*. These cases highlight how holistic approaches grounded in balance, integration, and environmental harmony are essential for achieving sustainability.

Keywords: sustainability, mindfulness, gross national happiness, green construction, green hydrogen, electronic vehicle

Introduction

Sustainability has emerged as a critical discourse in the face of accelerating ecological and social crises. Dr. Urs Lustenberger, Chairman of SwissCham ASIA, at the beginning of the webinar, posed a pivotal question during the "From Green to Sustainability" webinar: *Are current "green" initiatives sufficient to address the complexities of sustainability, or do they merely scratch the surface of more profound systemic challenges?* This inquiry invites a comprehensive discussion of what it means to transition from superficial green practices to genuinely sustainable systems.

To frame this discussion from this webinar, the paper draws on the foundational insights of Meadows et al.'s *"Limits to Growth"* (1972), which introduced systemic thinking about sustainability. The paper of Meadows et al. (1972) underscored the finite nature of Earth's resources and the risks posed by unchecked population and economic growth. It advocated for a balanced, adaptive approach to development, highlighting the importance of addressing interconnected ecological and social systems. It informs the exploration of whether current "green" initiatives adequately address these challenges or risk perpetuating superficial solutions.

Accordingly, this paper integrates four key case studies and theoretical frameworks to propose a*n ecological comprehensive framework for sustainability.* Bhutan's Gross National Happiness Index and Gelephu Mindfulness City illustrate the value of holistic well-being over GDP-centric growth,

while technological advancements in timber engineering, hydrogen energy, and electric vehicles demonstrate innovative solutions to decarbonise critical sectors. Additionally, Dr Ying Zhang's *dynamic sustainability framework*, in combination of her illustration of UN's SDG9 ((https://repub.eur.nl/pub/118282/SDG9-Ying-Zhang-.pdf), and the inspiration from the Yin-Yang theory and five elements theory, provides a paradigm for understanding the balance and interdependence necessary to achieve systemic harmony. These approaches underscore the necessity of reimagining sustainability to align with ecological and societal systems' complex and interdependent dynamics.

Literature Review

Sustainability has evolved from an abstract idea to a critical framework for addressing the interconnected challenges of environmental degradation, resource depletion, and social inequality. Recent studies have highlighted how sustainability frameworks have adapted to meet global challenges such as climate change, biodiversity loss, and social inequity. For instance, advancements in circular economy principles and regenerative design emphasise minimising harm and actively restoring ecological systems. Similarly, resilience theory underscores the importance of adaptability in the face of increasing uncertainties, from economic disruptions to environmental crises. These evolving frameworks reflect the growing recognition that sustainability requires dynamic, integrative approaches to balance ecological, social, and economic systems effectively. Key conceptual advancements have emerged over time, including the Brundtland Report's definition of sustainability as meeting the needs of the present without compromising future generations (Brundtland Commission, 1987). Theories such as *Daly's steady-state economy* advocate for maintaining ecological limits while promoting equitable resource distribution (Daly, 1991), and *Ostrom's polycentric governance* emphasises decentralised and participatory management of shared resources (Ostrom, 1990).

Raworth's doughnut economics further expands on these ideas by envisioning a framework that balances ecological ceilings and social foundations, ensuring that human activities remain within planetary boundaries while addressing human needs (Raworth, 2017). Dr Ying Zhang's *ecological comprehensive framework* builds on these foundations, drawing inspiration from Taoism's Yin-Yang five elements theory to posit that achieving sustainability requires understanding the dynamic relationships and roles of ecological, social, and economic systems in maintaining systemic balance (Zhang, 2019, 2022). Additionally, Dr Zhang emphasises the integration of SDG 9—sustainable industrialisation, innovation, and resilient infrastructure—as a vital dimension of systemic sustainability. By promoting sustainable industrial practices, fostering technological breakthroughs, and developing resilient infrastructures, societies can address both ecological and

socio-economic challenges. These elements align with the broader concept of maintaining ecological balance while enabling innovation-driven growth, making them essential for achieving holistic sustainability.

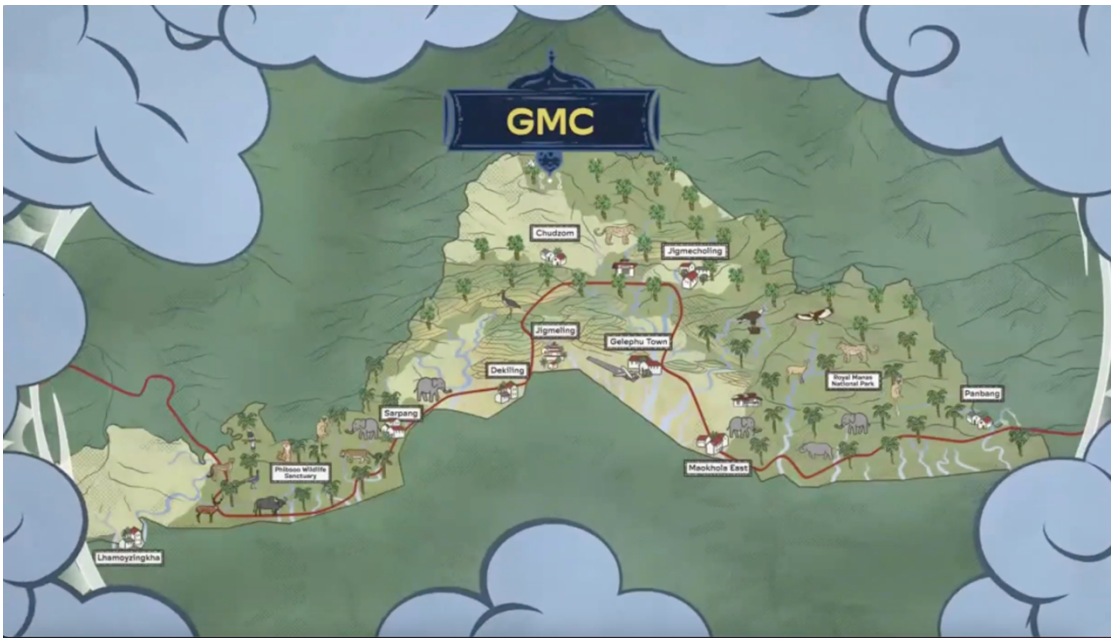
Four Cases

This section examines four key cases presented on the webinar of Nov. 28. 2024. Each case illustrates a distinct approach to achieving sustainability through innovation, systemic balance, and ecological integration. These cases include *Bhutan's holistic governance framework, green construction through timber engineering, hydrogen energy innovations, and advancements in the electric vehicle sector.* Together, they highlight the practical application of theoretical sustainability principles, including Dr. Ying Zhang's integration of SDG 9 into ecological balance frameworks.

1. Bhutan's Pioneering Sustainable Development Model

The keynote address by Tenzin Wangchuk, Ambassador of the Kingdom of Bhutan to Switzerland, provided a striking case study of a nation that has successfully transcended the prevailing dichotomy between economic progress and ecological stewardship. Bhutan's groundbreaking Gross National Happiness (GNH) development philosophy, first promulgated in the 1970s, reflects an unwavering commitment to "balancing economic growth, preservation of the environment, Bhutan's traditions, and culture, amongst others."

As Ambassador Tenzin Wangchuk explained, this holistic vision was constitutionally codified in 2008 through a pioneering environmental mandate that "requires a minimum of 60 per cent of Bhutan's land area must be maintained under forest cover for all time." Bhutan's singular success in upholding this ambitious standard - with over 70% of its territory currently forested - has established the nation as a beacon of sustainability, offering an empirical counterpoint to deterministic assumptions of inexorable environmental degradation as the price of modernisation.



Ambassador Tenzin Wangchuk underscored the profound implications of Bhutan's ecological stewardship, noting that "Bhutan is a carbon negative country" annually sequesters more greenhouse gases than it emits. He asserted that Bhutan's journey demonstrates that "we can achieve economic growth while conserving our environment and pursuing a path of sustainable development." Indeed, Bhutan's record of concurrently raising living standards, safeguarding cultural and ecological heritage, and nurturing sustainable industries through the GNH framework provides a compelling template for intentional development in an era of planetary emergency.

Beyond leading by domestic example, Ambassador Tenzin Wangchuk highlighted Bhutan's proactive efforts to mobilize an international coalition for transformative climate action, most recently through its central role launching the groundbreaking G Zero alliance of carbon neutral and negative countries at COP 29 to "advance global efforts towards a net zero, climate resilient and nature positive world." Tenzin Wangchuk further outlined Bhutan's visionary plan to establish a cutting-edge Gelephu Mindfulness City designed entirely "based on the concepts of mindfulness and sustainability" and wholly powered by renewable energy.

Ambassador Tenzin Wangchuk's thought-provoking testimonial throws into stark relief the fundamental inadequacy of incrementalistic approaches to sustainability and underscores the manifest viability and urgent necessity of revolutionary development models guided by Bhutan's GNH philosophy. Tenzin Wangchuk's powerful message reaffirms that an uncompromising

commitment to sustainability, far from inhibiting living standards and modernization, is in fact integral to realizing truly shared and enduring prosperity.

As an academic reflecting on Ambassador Tenzin Wangchuk's remarks, people should be struck by the profound implications of Bhutan's pioneering model for reimagining the very foundations of development theory and praxis. The GNH framework represents a direct challenge to the hegemonic logic of neoliberal economics, which reduces human flourishing to an algorithmic function of aggregate GDP growth and reframes sustainability as an existential imperative and moral duty transcending narrow materialist parameters.

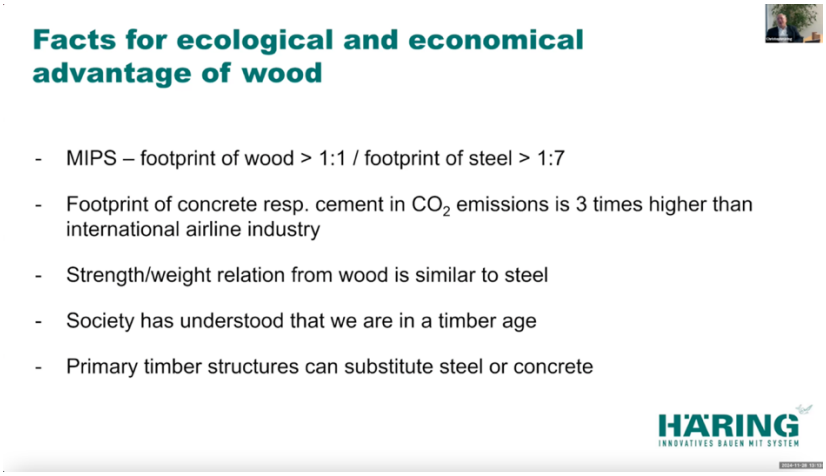
Ambassador Tenzin Wangchuk's call to embrace a development paradigm premised on "prioritising the well-being of our people and the health of our environment" evokes a transformative conception of political economy that subordinates market dynamics to the inviolable prerogatives of ecological integrity, social cohesion, and spiritual fulfillment. In an age of dystopian visions of looming civilizational collapse, Bhutan's luminous example of sustainable modernization - achieved through an unwavering commitment to integrating timeless wisdom, communal values, and natural reverence into the very heart of development strategy - represents a beacon of inspiration and a template for replication.

Of course, adapting Bhutan's unique model to the immensely divergent contexts of societies across the Global South and North presents myriad challenges demanding rigorous analysis and creative problem-solving. Yet the essential principles and practices embodied by the GNH framework - holistic metrics of progress, non-negotiable ecological parameters, participatory governance, and localized solutions - provide the indispensable foundations for any authentic sustainability paradigm. As humanity navigates the uncharted waters of a turbulent century, Bhutan's enduring lesson is that there is no viable future without a fundamental renegotiation of our conceptions of development, measures of wellbeing, and relationship to the community of life. Our very survival depends on heeding this clarion call.

2. Häring Group to foster the Green Construction

The immense opportunities presented by sustainable construction methods were vividly illustrated by Christoph Häring, owner of Häring Group. Sharing insights gleaned from four decades pioneering engineered wood structures, Christoph Häring expounded on the vast untapped potential of renewable construction materials to dramatically reduce the climate and environmental impact of our built environment while delivering an array of ancillary social benefits.

Häring Group's groundbreaking projects spanning Europe and Asia, from monumental transportation hubs and spiritual landmarks to expansive commercial centers and novel disaster-resilient buildings, constitute a compelling proof of concept for the viability of engineered timber as a functionally advantageous and ecologically optimal substitute for carbon-intensive steel and concrete. As Christoph Häring explained, scientific breakthroughs in materials engineering and fabrication techniques have enabled the development of mass timber components "much bigger than an entire tree" that match or exceed the performance of conventional alternatives across key parameters like "strength, weight, cost, and construction speed" while boasting an unrivaled sustainability profile.



Christoph Häring 's assertion that "society worldwide has understood it is an interesting and good challenge to be in the Timber Age" reflects a rapidly accelerating paradigm shift in the construction industry, which is increasingly embracing renewable structural materials recognizing their immense decarbonization potential. This transition assumes profound importance considering Christoph Häring's revelation that concrete alone is responsible for "three times more CO2 emissions than the entire global airline industry," a shocking fact that remains woefully under-recognized.

Christoph Häring's expansive vision for sustainable construction transcends myopic conceptions of net zero to present an inspiring model of buildings as active agents of regeneration. Christoph Häring proposed "green tower system" for earthquake-prone regions exemplifies the potential to synergistically promote ecological and social wellbeing by combining carbon sequestration with seismic resilience. As Christoph Häring argued, the engineered wood revolution heralds an unprecedented paradigm "where construction becomes light, fast, and green as everybody wishes to change this world."

As an academic reflecting on Häring Group and represented by the owner Christoph Häring's pioneering work, people should be inspired by the immense potential of engineered wood to serve as a transformational climate solution and wellspring of ecological renewal. The sustainable construction transition represents an unparalleled opportunity to transmute one of modernity's most polluting and consumptive industries into a powerful force for atmospheric carbon removal and disaster resilience, delivering cascading co-benefits across environmental and social dimensions.

At the same time, Christoph Häring's insights underscore that the decarbonisation promise of mass timber remains contingent on an unwavering commitment to sustainable forestry practices, lifecycle assessment of material inputs, and integration with renewable energy throughout the construction process. Without robust guardrails ensuring the rigorous conservation of forest landscapes, enforcing stringent emissions standards across supply chains, and optimising buildings

for operational efficiency, the ostensible benefits of sustainable construction risk being vitiated by rebound effects and perverse incentives.

Moreover, as with any sustainability transition, the engineered wood revolution confronts an array of daunting obstacles, from entrenched resistance by vested interests to the inertia of building codes, risk-averse insurers, and myopic policymaking. Transcending these barriers to achieve the full potential of green construction demands an unprecedented mobilization of political will, institutional coordination, and financial resources aligned around an overarching mission of decarbonization and regeneration.

Häring Group's pioneering projects demonstrate that when visionary enterprises, progressive governments, and conscious consumers collaborate around shared principles of ecological stewardship, truly transformational change becomes possible. The sustainable construction movement's ultimate success, however, hinges on embedding this spirit of purpose-driven partnership into the very heart of our political economy. We must forge a new social contract premised on the recognition that our buildings are not merely utilitarian shelters, but sacred vessels for nurturing community, cultivating resilience, and regenerating the living world. Nothing less than the future of our civilization depends on it.

3. REFIRE: Hydrogen's Critical Role in the Clean Energy Transition

Dr. Chris Guzy, CTO of REFIRE Group, offered a comprehensive overview of hydrogen's pivotal role in decarbonizing the "difficult-to-abate" sectors that remain disproportionately reliant on fossil fuels. He emphasized that fully realizing hydrogen's immense emissions reduction potential across heavy industry, long-haul transport, and seasonal grid balancing is contingent upon massively scaling up production through electrolysis powered by cheap and abundant clean electricity.

Dr. Chris Guzy's analysis threw into sharp relief the reality that hydrogen's sustainability attributes are fundamentally derivative of the underlying energy sources used in its manufacture. As he noted, "it's critically important to integrate hydrogen production with renewable energy deployment" to ensure that this notionally clean "energy carrier" does not become a backdoor for perpetuating fossil fuel extraction. Dr. Chris Guzy's comments underscore that the sustainable hydrogen transition cannot be pursued in isolation but must be consciously conceived and strategically executed as an integral component of a coordinated global effort to eliminate greenhouse gas emissions across all sectors.

Dr. Chris Guzy further highlighted the expansive range of carbon-intensive industrial activities positioned to adopt clean hydrogen as a wholesale replacement for coal, oil, and gas, including "cement and ammonia production, the direct reduction of iron in steelmaking," as well as heavy transport applications "like trucking fleets, port equipment, and rail networks." Dr. Chris Guz's recitation of decarbonization opportunities, coupled with his observation that 50 nations have now developed dedicated hydrogen strategies, illustrates the technology's unrivaled potential to catalyze systems change at the required pace and scale.

However, Dr. Chris Guzy also forthrightly acknowledged that the sustainable hydrogen transition, while gradually gaining momentum, remains at an incipient stage and confronts an array of complex challenges. Dr. Chris Guzy noted candidly that the process of deploying hydrogen solutions is "complicated and progressing far more slowly than one would hope," reflecting the

immense complexity of forging radically novel supply chains, transmission networks, and delivery modalities for an emergent energy paradigm still beset by technical and economic uncertainties. Despite these headwinds, Dr. Chris Guzy expressed guarded optimism that "now that more countries are involved and focusing their efforts on use cases that are economical... there are signs of real progress."

Citing REFIRE Group's unparalleled operational experience in China, which has deployed fuel cell vehicles orders of magnitude faster than the rest of the world combined, Dr. Chris Guzy credited the nation's singular capacity to expeditiously conduct large-scale demonstration projects and leverage learnings to the unrivaled dynamism of its industrial ecosystem. Dr. Chris Guzy predicted this peerless ability to rapidly design, integrate, and iterate solutions will propel China to an insurmountable lead in hydrogen technology, mirroring its current dominance of the lithium-ion battery industry.

Dr. Chris Guzy recurrently emphasized that the ultimate success and impact of the hydrogen transition is predicated on cultivating robust "ecosystems" comprising sustainable production assets, transmission infrastructure, bulk storage facilities, end use equipment, and critically, off-taker demand across myriad applications. This holistic perspective reflects an appreciation that hydrogen's decarbonization potential is not merely a technological challenge, but even more so a coordination problem demanding committed, long-term orchestration between policymakers, utilities, manufacturers, industrial adopters, and financial institutions.

As Dr. Chris Guzy's rigorous analysis makes abundantly clear, hydrogen indisputably assumes an indispensable role in the panoply of solutions required to achieve economy-wide net zero emissions. However, its ultimate ability to deliver sustainable and durable outcomes at global scale hinges on an unyielding commitment to full integration with zero carbon energy sources as well as an unprecedented degree of cross-sectoral collaboration to stand up the requisite enabling environment.

As an academic processing Dr. Chris Guzy's insights, people should be energized by hydrogen's immense potential to break the stubborn stranglehold of fossil fuels on the commanding heights of the industrial economy, offering an actionable pathway to achieve the wholesale decarbonization of the most recalcitrant sectors. At the same time, Dr. Chris Guzy's clarion call for a genuine "ecosystems approach" to the hydrogen transition - one that rigorously maps and models the interdependencies between innumerable stakeholders - underscores the fundamentally multifaceted and collaborative character of any credible route to net zero. Far from a convenient techno-fix, clean hydrogen epitomizes the kind of "grand systemic project" whose fruition demands a societal mobilization akin to a wartime effort in scale and urgency.

Moreover, Dr. Chris Guzy's trenchant observations on China's asymmetric capacity to drive cost and performance breakthroughs through unparalleled cycles of learning by doing calls into question prevailing assumptions of Western technological preeminence. Dr. Chris Guzy's prediction that China is poised to dominate the hydrogen industry as authoritatively as it has cornered the battery market represents a serious strategic warning demanding a reevaluation of US and European industrial policy. Absent a herculean effort to supercharge our domestic innovation systems and champion international cooperation, we risk ceding control of a critical decarbonisation pathway to our most formidable geopolitical rival, imperilling any prospect of an equitable green transition on our terms.

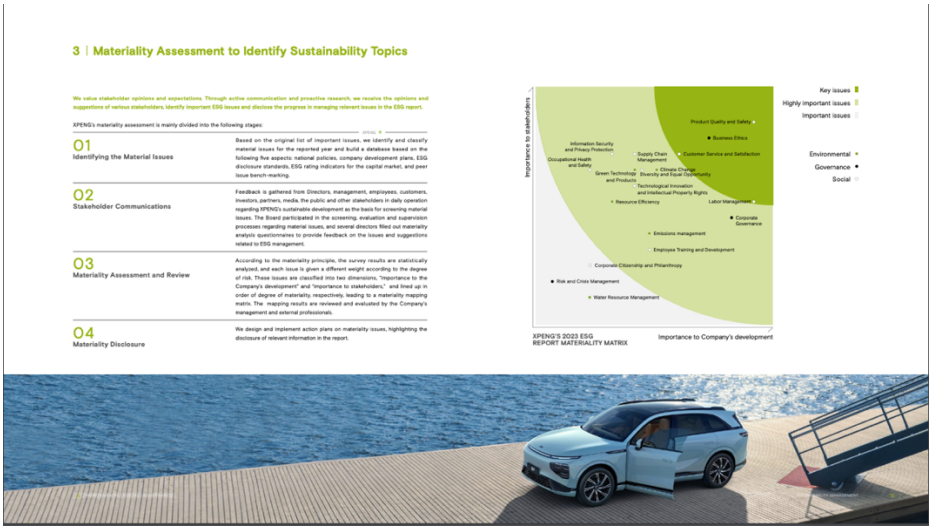
At an even deeper level, the emerging hydrogen economy invites a fundamental rethinking of energy geopolitics for an age of inexorably diminishing fossil fuel dependence. As sustainable molecules produced anywhere from ubiquitous renewable resources displace geographically concentrated hydrocarbons, the familiar logic of zero-sum resource competition between nations inevitably yields to an emergent paradigm of positive-sum cooperation in furtherance of a common ecological objective. The ultimate lesson of Dr. Chris Guzy's analysis is that a flourishing future is possible, but it demands transcending the cramped horizons of national rivalry to embrace a cosmopolitan ethos of shared sacrifice and collective salvation. In a very real sense, hydrogen embodies the elemental truth that our fates and all living beings are entwined as densely as the chemical bonds it so miraculously forges.

4. Xpeng: China's Electric Vehicle Revolution

Ning Ning, Business Development Manager at Xpeng, offered an illuminating frontline perspective on China's astonishing metamorphosis into the world's undisputed epicenter of electric vehicle (EV) deployment, innovation, and industrialization. Ning Ning framed this tectonic shift as far more than a simple substitution of propulsion technologies, asserting that vehicle electrification in fact "provides a foundational platform enabling not only the integration of alternative energy pathways, but also radical experimentation with novel approaches to sustainable mobility."

Ning Ning expounded on the panoply of EV-enabled breakthroughs being pioneered by Xpeng and its peers that promise to synergistically amplify the decarbonization impact of transport electrification, foremost among them advanced "vehicle-to-grid" systems that intelligently leverage the massive, distributed storage capacity of EV batteries to "flatten peak electricity demand" and "relieve grid congestion." Such elegant solutions, which deftly transform a critical challenge of the renewable energy transition into a powerful grid management asset, reveal the

immense potential for electrified transport networks to catalyze positive cascading impacts across interdependent energy, information, and urban systems.



Ning Ning further highlighted the Chinese EV industry's enthusiastic embrace of green manufacturing principles as a core pillar of its overarching sustainability strategy. Ning Ning emphasized that "the vast majority of automakers are aggressively retrofitting their factories with onsite solar generation and procuring renewable electricity, markedly improving the efficiency of the production process." Ning Ning's observation reflects a growing recognition throughout the EV ecosystem that a credible decarbonization effort must transcend a myopic focus on vehicles to rigorously assess and optimize the lifecycle footprint of batteries, materials, and manufacturing.

Perhaps most provocatively, Ning Ning outlined an audacious vision for a novel EV-anchored "mobility-as-a-service" paradigm premised on ubiquitous fleets of shared autonomous electric vehicles. Ning Ning described the revolutionary potential of obviating individual car ownership with a seamlessly integrated network of "intelligent EVs with the ability to dynamically reposition in response to real-time mobility demand," dramatically improving the utilisation of transport assets while decreasing the resource intensity of the overall system. While readily acknowledging the manifold technological and regulatory obstacles to achieving this ambitious goal, Ning Ning presented it as the inexorable endgame of an EV revolution that promises to redefine "the operating system of human mobility fundamentally."

Ning Ning unambiguously attributed China's world-leading progress in vehicle electrification to the central government's resolute focus and unwavering support. He stressed that "EV deployment targets have been a centrepiece of the latest national five-year plans". He credited China's unrivalled dynamism in this domain to a unique species of "strategic industrial policy" that

provides a predictable long-term demand signal and sustained support for innovation along the entire value chain.

At the same time, Ning Ning acknowledged that China's state-led growth model has been deeply informed and immeasurably strengthened by "extensive collaborations with leading European and North American automotive brands to co-develop critical technologies." Indeed, China's singular capacity to rapidly assimilate advanced EV innovations through industrial partnerships and joint ventures exemplifies the immense potential of intentional international cooperation to accelerate the global sustainable mobility transition dramatically.

As Ning Ning's enlightening commentary clarifies, vehicle electrification represents an unparalleled decarbonisation opportunity with salutary impacts reverberating across power, transport, industry, and urban systems. However, his analysis also throws into sharp relief the insufficiency of facile "green growth" narratives portraying EVs as a panacea, clarifying that the true extent of their environmental benefits remains contingent on integration with zero-carbon electricity, rigorous lifecycle management of batteries and materials, and a wholesale redefinition of vehicle ownership and utilization models. Above all, China's unrivalled example, propelled by decisive and sustained policy leadership, demonstrates that capturing this potential demands a root-and-branch restructuring of the political economy that sadly continues to elude much of the West.

As an academic reflecting on Ning Ning's compelling insights, People should be energised by the immense potential of EVs to catalyse systems transformation well beyond the narrow confines of the automotive sector. If strategically harnessed, the electrification of transport networks could serve as a crucial pillar of the renewable energy transition, providing an unparalleled source of flexible demand and decentralised storage to accommodate the variability of emergent solar and wind power. Moreover, the prospect of dynamically dispatched autonomous EVs opens up tantalizing possibilities for a wholesale reimagining of cities around the primacy of human wellbeing, reclaiming vast swathes of urban space from the tyranny of the private automobile to create vibrant landscapes of community, creativity, and biodiversity.

At the same time, Ning Ning's US-China comparative lens offers a sober reminder that the EV transition, notwithstanding its aura of ecological enlightenment, remains inextricably entangled with the ruthless calculus of great power competition. China's breakthroughs in this domain are unquestionably a boon for our collective climate and development objectives. But its consolidation of unassailable supremacy over the commanding heights of the emerging green economy threatens to relegate the US and Europe to a position of technological and geo-economic vassalage with stark implications for our long-term competitiveness and strategic autonomy.

As we stand on the threshold of an EV revolution that promises to redefine the very fabric of human civilisation, Ning Ning's clarion call for a fundamental reorientation of our political

economy to align with the imperatives of sustainability and resilience assumes existential urgency. In the absence of a US and European mobilisation to rewire innovation ecosystems, supercharge green industrial policy, and unleash authentic international cooperation on a heroic scale, we risk forfeiting the unparalleled opportunity of vehicle electrification to a mercantilist Chinese model inimical to liberal values and democratic priorities. Our civilisation's ultimate trajectory in this century hinges in no small part on our willingness to match China's boldness of vision and force of action in this critical arena. The alternative is almost too bleak to contemplate.

Confronting Barriers: Political, Economic, and Behavioral Impediments

The discussions throughout the webinar revealed a consistent array of systemic tensions and challenges that significantly impede progress toward genuine sustainability across political, economic, social, and individual spheres. The insights shared by the distinguished panellists illuminated that the most formidable barriers to achieving a regenerative transformation are not primarily technological but rooted in the structures, incentives, and paradigms shaping human decision-making and behaviour.

Farhat Ali

Farhat Ali, sitting at the Swiss Business Council as a Chairperson of Switzerland Global Enterprise and Foreign Affairs Committee of provided a critical perspective that counterbalanced the predominantly technocentric sustainability discourse in Western policy circles. Farhat Ali argued compellingly that while advancements in renewable energy, transportation, and industrial innovation will undoubtedly accelerate decarbonisation in resource-rich developed economies, these capital-intensive approaches are ill-suited to address the scale and urgency of challenges faced by the Global South.

Farhat Ali highlighted the plight of nearly two billion impoverished individuals in developing regions such as South Asia, who are already grappling with catastrophic climate impacts, ecosystem degradation, and exploitative extractive practices. For these populations, he emphasised, the immediate priorities must focus on adaptation and resilience-building rather than on costly and complex mitigation strategies. Farhat Ali further contended that without prioritising "people-centric development," technological progress risks being overshadowed by escalating crises of poverty, displacement, and social unrest.

Farhat Ali's assertions underscore the necessity of abandoning the prevailing "techno-optimist orthodoxy" in favor of holistic, context-sensitive strategies that account for the unique resource, capacity, and governance limitations of emerging economies. His advocacy for granular, community-driven solutions—grounded in traditional knowledge, regional assets, and indigenous

sovereignty—underscores the inadequacy of universal models of sustainable development that fail to reflect the diverse realities of nations and communities.

Claude Jaeck

Claude Jaeck, Foreign Trade Advisor to the French Government, examined structural barriers, citing individual behaviors and corporate governance systems that perpetuate unsustainable trajectories. He argued further that meaningful transformation at the personal level would require a profound psychological and cultural shift, necessitating individuals to relinquish the superficial comforts of consumerism in favour of values rooted in meaning, connection, and service.

His call for an "emergent ethos of human flourishing and natural symbiosis" reflects both the depth of reform necessary to address interlinked crises and the limitations of conventional sustainability narratives. His analysis asserts that transcending the failed paradigms of the past demands not incremental policy adjustments but a fundamental redefinition of human identity, aspirations, and world-views.

At the same time, Claude Jaeck acknowledged the formidable challenge of fostering such a paradigm shift within a global political economy dominated by priorities of GDP growth, shareholder value, and profitability. He criticized the tendency of many enterprises to perceive sustainability as an external cost or reputational liability rather than an essential and strategic opportunity. His critique highlights the tensions between the profit-driven logic of contemporary capitalism and the holistic, regenerative mindset required to address the current ecological crisis.

Despite these challenges, he identified sources of optimism. He praised the activism and creativity of younger generations as a potent force for renewal, noting their instinctive commitment to building a sustainable future. Similarly, he commended the emerging influence of purpose-driven enterprises, regenerative communities, and transnational advocacy networks in advancing transformative change. He advocated for the establishment of globally coordinated yet locally implemented mechanisms to incentivise sustainable practices equitably.

Ultimately, Claude Jaeck concluded that a credible sustainability revolution necessitates a profound reimagination of the human experience and a radical restructuring of political and economic systems. Without deliberate efforts to reform the institutions, values, and reward mechanisms shaping societal outcomes, the gap between ecological imperatives and actual practices will continue to widen, leaving even the most visionary proposals unrealized.

Ying Zhang

Prof. Dr. Ying Zhang, President of Singularity Academy, pushed this institutional critique to the epistemic level, arguing that the hegemonic frameworks we deploy to conceptualise and evaluate sustainability are fatally flawed and limiting. Prof. Dr Ying Zhang contended, in a formulation as arresting as it is incisive, that "the concept of sustainability, notwithstanding its axiomatic status in contemporary discourse, remains devoid of any ontologically meaningful or operationally relevant system of measurement." Her insight reflects the irreducible value judgments encoded in any model of accounting or assessment and the "egregious incapacity of extant paradigms to apprehend the complex, interdependent, and emergent properties of the systems in which we are irrevocably embedded."

Prof. Dr. Ying Zhang evocatively likened the current state of sustainability theory and praxis to a "conceptual prison," one in which myopic fixations on superficially "green" interventions and a lack of rigorous epistemological foundations fatally inhibit the expansiveness of vision and audacity of action demanded by our interlocking crises. She observed mordantly that the proliferation of incommensurable and competing sustainability plans across jurisdictional scales, pursued in a spirit of "nationalistic rivalry rather than mutualistic symbiosis," demonstrates with "depressing clarity that we are far from achieving any meaningful consensus around even the most rudimentary parameters of a coherent response."

To transcend the crippling limitations of our existing models, Prof. Dr. Ying Zhang exhorted the sustainability community to "build from first principles a novel framework to authentically embody true mindfulness of the totality of human experience and the community of life." Prof. Dr. Ying Zhang argued that any paradigm adequate to the challenge of our moment must embrace a "fractal, non-reductionist epistemology" capable of grappling with the "radical interdependence and irreducible complexity of socio-ecological systems." For Prof. Dr. Ying Zhang, Bhutan's groundbreaking Gross National Happiness framework represents a "luminous exemplar of the integral, contextual thinking" indispensable to conceptualise and operationalise authentic sustainability properly. Prof. Dr. Ying Zhang emphasised that the "priceless philosophical and cultural treasures" embedded in Bhutan's approach, which "transcend the cramped utilitarianism of conventional development economics to encompass the higher dimensions of wisdom and fulfillment," embody precisely the sort of "civilisational mutation" required to realize a "beneficent and beautiful human-Earth partnership."

As Prof. Dr. Ying Zhang's breathtaking peroration makes abundantly clear, the most implacable barriers to genuine sustainability inhere not merely in the economic and political substrates of our world system, but even more so in the very texture of our thoughts - the cognitive models and existential metaphors through which we apprehend and construct our realities. Her luminous call to reimagine the fundamental categories by which we know ourselves and our world invites us to embrace a thrilling and terrifying recognition. There is no magical set of technocratic reforms or

policy fixes capable of resolving challenges that are, at their core, crises of institutions, ethics, and spirituality. An authentic paradigm shift demands nothing less than a revolutionary transmutation of consciousness itself - a renegotiation of our most deeply held beliefs about the nature of the cosmos, the meaning of the human experience, and our inextricable embeddedness in the community of life.

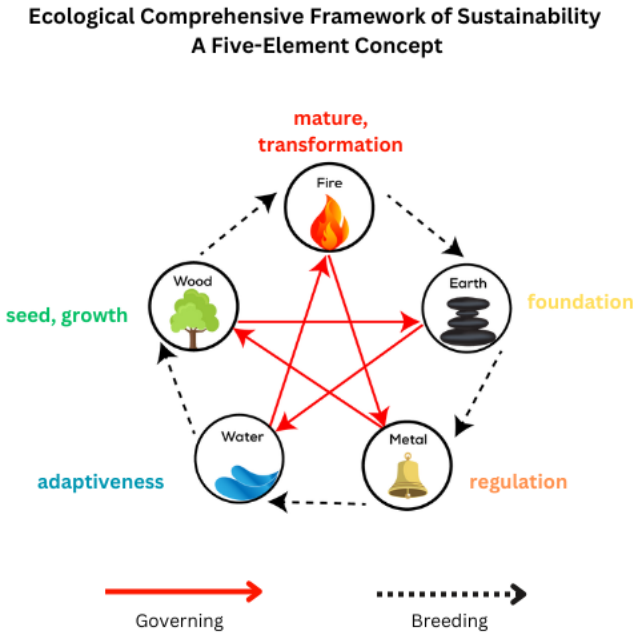
As we confront a turbulent century of interlocking crises that will, likely, determine the ultimate trajectory of our species, the incandescent dialogues of this webinar resoundingly reaffirm an incontrovertible and urgent truth. A bold new paradigm premised on a world-centric vision of shared flourishing and radical commitment to regenerative action represents our only viable pathway to a thriving future. The pioneering example of Bhutan, together with the panoply of breakthrough innovations across green building, clean energy, and sustainable transportation, demonstrates persuasively that another world is indeed possible. But its realization hinges on an unflinching willingness to relinquish the certitudes and conventions of our failing system of axioms to embrace an emergent ethos of wisdom, imagination, and solidarity up to the challenge of the hour.

Theoretical Implication: An Ecological Comprehensive Framework

Following the discussion from this webinar, Prof. Dr Ying Zhang proposed ***an ecological comprehensive framework*** rooted in Taoism's Yin-Yang five elements theory, which offers a profound lens for understanding sustainability.

The five elements embedded in the Yin-Yang five elements theory include wood (green), fire (red), earth (yellow), metal (white), and water (blue), which represent the unit of nature and dynamic interactions within ecological systems. In the upgraded theoretical framework, Prof. Dr. Ying Zhang stresses that sustainability requires maintaining *balanced growth and quality* within and between these elements across *time and space*, especially from the aligned dynamic relationships of *cause-effect and opposition-unity* between each pair of elements. This alignment ensures that industrialisation (quantity) and innovation (quality) should be interactively sustained within the *ecological thresholds in the time-space condition. At the same time,* the whole socioeconomic system that is supposed to support the principle of sustainability should support socioeconomic equity in both growth quantity and quality. To elaborate, the *cause-effect relationship (breeding effect)* determines the amount *of growth*, while the *opposition-unity relationship (governing effect)* defines *the quality of the growth*. For example, wood is the direct cause of the fire, meaning that advancing renewable energy solutions (fire) can be stimulated by industrial growth (wood) (to a threshold) in terms of quantity. At the same time, wood also oppositely governs the quality of the earth, indicating that resilient infrastructure (earth) that ensures long-term stability must be

watched and controlled by the seed of innovation and growth of sustainable industries (wood). In contrast, metal governs the quality of wood, indicating that the policies and regulations promoting circular economies and resource efficiency (metal) can not only facilitate international collaboration (water) (breeding effect) but also oversee the quality of the subsequent round of innovative seeds and growth (governing effect), highlighting the interconnectedness of these principles. By linking the Yin-Yang five elements theory and SDG 9 Lecture for UN SDG by Prof. Dr Ying Zhang (2019), this implicated *ecological comprehensive framework* provides a pathway for achieving long-term sustainability with more inclusive, adaptive, and deeply integrated global development goals. To make a clear presentation, the graph of the five elements corresponding to the ecological comprehensive framework is shown below.



Derived from Prof. Dr. Ying Zhang's book (Zhang, 2022).

Conclusion

The "*From Green to Sustainability*" webinar of Nov. 28. 2024 by Singularity Academy and SwissCham ASIA highlighted the urgent need to transition from superficial environmental practices to a holistic, regenerative sustainability model. Drawing on case studies from *Bhutan, green construction, hydrogen energy,* and *electric vehicles,* the discussions emphasised the

importance of integrating ecological harmony, social equity, and systemic innovation. Key insights included Bhutan's Gross National Happiness framework as a well-being and environmental stewardship model, hydrogen's role in decarbonising heavy industries, and EVs as catalysts for systemic energy and mobility transformation.

Theoretical contributions, such as Prof. Dr. Ying Zhang's *ecological comprehensive framework*, underscored the need for balance, adaptability, and collaboration to achieve sustainability. Panellists called for reimagining societal values and governance to overcome entrenched barriers and foster a regenerative future. The webinar concluded that a sustainable civilisation requires bold systemic changes, collective action, and a renewed commitment to ecological integrity and intergenerational well-being.

References

1. Brundtland Commission. (1987). Our Common Future. Oxford University Press.

2. Daly, H. (1991). Steady-State Economics. Island Press.

3. Ostrom, E. (1990). Governing the Commons. Cambridge University Press.

4. Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). The Limits to Growth . Universe Books.

5. Raworth, K. (2017). Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Random House Business.

6. Zhang, Y. (2019). Sustainability Development Goal 9 Industry, Innovation and Infrastructure. SDG 17 Lectures. RSM Erasmus University https://repub.eur.nl/pub/118282/SDG9-Ying-Zhang-.pdf

7. Häring Group. Innovations in Green Construction. Retrieved from [www.haring.ch].

8. REFIRE. Hydrogen Energy Solutions. Retrieved from [www.refire.com].

9. Xpeng Motors. Smart Electric Vehicles. Retrieved from [www.xpeng.com].

10. Sen, A. (1999). Development as Freedom. Anchor Books.

11. Zhang (2019) SDG 9 Open Lecture, RSM Erasmus University, the Netherlands. https://www.rsm.nl/positive-change/sdgs/sdg-9-industry-innovation-and-infrastructure/

12. Zhang (2022). Mental Health, Psychiatric Disorders, and the Implications of Long Covid-19. Published by Singularity Academy, Switzerland. Oct. 1. 2022. ISBN:978-3-033-09459-8 (print) 978-3-033-09460-4 (digital)