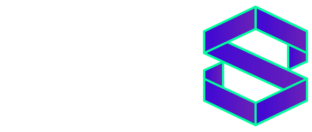
SPECTRA

ECONOMICS

# PROPOSING AN ECONOMY OF HEALTHY GROWTH, COOPERATIVISM, AND HOUSING ABUNDANCE

Version 0.1



# SPECTRA

## SPECTRAN ECONOMICS

Proposing an economy of healthy growth, cooperativism, and housing abundance

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# 0 Executive Summary

Spectra is a multidisciplinary project to solve existing problems in cities and define a new model of sustainable, human-centered, and technologically progressive urbanization. The Spectra Whitepaper identifies the primary mission of the project as building a sustainable, livable, and affordable city for at least one million people.

To achieve this mission, Spectra must overcome obstacles which broadly characterize urban economics: inequitable growth, environmental degradation, and non-participation. Over the past four decades, especially, disparities in wealth and power have widened at the expense of the poor, the middle class, and the environment.

Addressing the roots of these systemic problems requires experimenting with new economic systems. We need the freedoms provided by a new city in order to experiment without running into the ill-fitting, counterproductive, and outdated policies, practices, and incentives which frequently characterize existing cities. As such, building a new city and designing a new economy are two sides of the same coin.

Spectra believes it is possible at the city level to correct the disregard of environmental degradation, the unfair distribution of economic growth, and the decay of democratic capitalism. To do so, Spectra is designing a new political economic framework which promotes urbanization, unlocks healthy economic growth, and revives pluralist democratic community practices.

This paper addresses the **Spectran economics** part of that framework. As in our Whitepaper, the ideas presented here are meant to be a springboard, rather than commandments set in stone. The first chapter provides an overview of the status quo and Spectra's proposal to create systemic change in new cities. The middle chapters (two through five) detail the economic and urban planning practices which support Spectra's goals. The sixth chapter concludes by introducing **Spectran governance** as defined in our accompanying paper.

By fostering healthy growth, cooperativism, and housing abundance, Spectra aims to build a sustainable, livable, and affordable city *for* the future.

## 0.1 Our practices tldr

This is a long paper. Recognizing this, we provide summaries for the ten 'practices' introduced in chapters two through five. If you are looking to just get the gist of Spectran economics, then this is the section for you. See the Table of Contents to jump to any sections that pique your curiosity, or read on for the full proposals, details, and citations.

1. **Healthy growth metrics**
   Economic growth is crucial, but how we measure it needs fixing. Metrics for healthy growth must also consider gains in social and resource productivity. The world needs a lot of genuine fair and green growth to meet global sustainable development goals on time. While metrics alone won't solve any problems, they are undeniably important.

2. **Healthy growth hub**
   Cities are economic hubs, but their growth is not always fair and green. Specializing as a healthy growth hub activates the 21st century economy we need. Whereas New York City has finance and San Francisco has software development, Spectra can be a hub for healthy growth firms innovating in renewable energy, smart transportation, virtual citymaking, circular waste systems, sustainable food chains, healthcare technology, education, and more. With this type of innovation, new cities can be built with smaller environmental footprints and better social impacts to boost developing economies and reform our societies.

3. **Multilayer cooperative structure**
   Cooperativism links value creation with value distribution. It nurtures healthy competition, bolsters collective resilience, aligns group economic incentives, and rewards hard work with fair compensation. Adapting traditional cooperativism with modern technology enables pooling the community's resources, energy, and ideas with trust, efficiency, and global reach.

4. **Tokens**
   Tokens are a member's stake in Spectra and compensate for their contributions. Tokens accrue value over time to reward individuals in the multilayer cooperative structure. By owning tokens, members own a part of Spectra and its assets.

5. **Land Value Recycling**
   Land is expensive and makes landowners a lot of money in existing cities. It drives up rents and development costs for the rest of us. Its consistent value appreciation also incentivizes landowners to not build—constricting housing supply and further increasing rents. Neutralizing rentier profits from land ownership through Land Value Recycling promotes

economic growth and housing development, lowers rents, distributes profits fairly to laborers and capital owners, and supplies a major source of funding for the physical city.

6. **Dense, mixed use, and modular planning**
   Cities produce agglomeration effects for innovation and economies of scale for industry. These benefits increase when cities are densely populated and have mixed use development. Removing zoning restrictions allows us to build new cities which better reflect the diverse needs and interests of residents. Modular block designs speed up construction timelines and accommodate incremental population growth. Both zoning reform and modularity unlock the ability to develop more housing supply.

7. **Non-market housing**
   Non-market housing, such as housing cooperatives, can offer lower prices because they don't seek to maximize profits for a private landlord. The cooperative members are the owners. Rent is collected to cover necessary costs, such as maintaining the building and paying off any loans for its construction. Over time, especially once any loans are paid off, rents can remain low while the rest of the market inflates. Accessible housing markets are good for society and the economy.

8. **Private and common ownership**
   Property and ownership rights protect important privileges of cooperatives and their members. Cluster cooperatives can hold authority on their land even though the value of that land is a common asset of the city cooperative. Individuals can participate in economic decision-making. Asset values accrue as Spectra grows, and this value is shared across members according to their stake.

9. **Investment and debt reform**
   An ever-increasing share of financial capital is held by a diminishing number of large entities. Banks finance this by creating more money through credit. The bulk of bank-generated credit is used to purchase existing assets to boost short-term gains in stock prices, rather than to make productive long-term investments in the real economy, such as capital equipment, R&D, and worker training. Reforming investment and debt practices would liberate healthy growth opportunities and create massive profits in the long-term.

10. **Community Fund**
    Finance should be long-term, work for society, and be replenished rather than extracted. Because innovation is inherently uncertain and investment comes with no guaranteed returns, the value that is collectively created should be fairly distributed across all contributors. The Community Fund catalyzes healthy local growth for people, planet, and profits through (p)redistributive funding across Spectra's multilayer cooperative structure.

# 1 Introduction

This chapter declares why, now more than ever, we must design a new economy for cities. It starts by summarizing the problems of the prevailing form of modern economic growth. We then venture across the economic and political spectra to propose Spectran economics, a three-part cure for the urban economy: healthy growth, cooperativism, and housing abundance.

## 1.1 Why propose a new economy for cities?

*"We need a vision that recognizes that we are at one of the great turning points in human history when the survival of our planet and the restoration of our humanity require a great sea of change in our ecological, economic, political, and spiritual values."*[1]

Cities are drivers of economic growth. More than 80% of global GDP is made in cities.[2] This economic growth will be crucial as an additional 1.5 billion people settle into rapidly expanding cities over the next ten to fifteen years. Economic growth can create jobs, improve nutrition, generate energy, foster education, and advance healthcare. It can also help us lift up people who still live in poverty around the world. Growth is central to the sustainable, livable, and affordable city.

Historically, though, the profits from growth have not been fairly distributed.[3] Instead, economic inequality tends to increase alongside growth.[4] This relationship between growth and inequality intensifies as cities increase in size and influence.[5] Inequality, in turn, has been shown to weaken the level and durability of economic growth in the long run, imposing a direct economic cost on everyone.[6] Benner and Pastor find that the single most important factor in derailing economic growth in a metropolitan region is the initial level of income inequality.[7]

[1] Attributed to Grace Lee Boggs. Sasha Costanza-Chock, *Design Justice: Community-Led Practices to Build the Worlds We Need* (Cambridge, MA: MIT Press, 2020), 104.
[2] Per Espen Stoknes, *Tomorrow's Economy: A Guide to Creating Healthy Green Growth* (Cambridge, Massachusetts: MIT Press, 2021), 89.
[3] Carles Boix, *Democratic Capitalism at the Crossroads: Technological Change and the Future of Politics* (Princeton, New Jersey: Princeton University Press, 2019).
[4] Henry George, *Progress and Poverty: An Inquiry into the Cause of Industrial Depressions and of Increase of Want with Increase of Wealth: The Remedy* (1879); Stoknes, *Tomorrow's Economy*; Chris Benner and Manuel Pastor, *Solidarity Economics: Why Mutuality and Movements Matter* (Great Britain: Polity Press, 2021); Boix, *Democratic Capitalism at the Crossroads*.
[5] Herman L.Boschken, "Income inequality and the imprint of globalization on U.S. metropolitan areas," *Cities* 121 (February 2022), https://doi.org/10.1016/j.cities.2021.103503.
[6] Federico Cingano, "Trends in Income Inequality and its Impact on Economic Growth," OECD Social, Employment and Migration Working Papers No. 163 (Paris, France: OECD, 2014), https://dx.doi.org/10.1787/5jxrjncwxv6j-en; Jonathan David Ostry, Andrew Berg, and Charalambos G. Tsangarides, *Redistribution, Inequality, and Growth* (IMF Staff Discussion Note, February 2014); Prakash Loungani, "The Power of Two: Inclusive Growth and the IMF," *Intereconomics* 52, no. 2 (March 2017): 92-99; IMF, *Fostering Inclusive Growth: G-20 Leaders' Summit* (IMG, June 26, 2017); OECD, *Growing Unequal? Income Distribution and Poverty in OECD Countries* (Paris: OECD, 2008); OECD, *In It Together: Why Less Inequality Benefits All* (OECD, 2015); M. Forster, W. Chen, and A. Llenanozal, *Divided We Stand: Why Inequality Keeps Rising* (Paris: OECD, 2011); World Bank, *Inclusion Matters: The Foundation for Shared Prosperity* (Washington, DC: The World Bank, 2013).
[7] Benner and Pastor, *Solidarity Economics*, 50-53.

Inequality slows growth along intersectional divides by: concentrating power in the wealthy—thus, weakening support for reforms, reducing trust in institutions, and threatening political stability; restricting education and social mobility; and reinforcing the consequences of racial and gender discrimination, including women's job access.[8] Greater inequality also causes worse health, shorter lives, and more violence.[9]

In most OECD countries, economic inequality is at its highest level in decades.[10] The richest 10% of people in these countries earn 9.5 times the income of the poorest 10%, compared to 7 times in the 1980s.[11] The richest 10% of the global population owns 84% of all stock value.[12] The number of billionaires has doubled since the financial crisis of 2008, and the 26 richest people own as much as half the world's population.[13] This inequality extends beyond individuals to include firms as well. From 1997 to 2012, the average market share of the top four US firms across all industries rose from 24% to 33%,[14] stifling the innovation that comes from free market competition. From 1997 to 2014, investment returns for the 90th percentile of non-financial, publicly traded firms grew 160%, while returns for the 25th percentile grew only 2%,[15] punishing smaller firms and their employees. The theory that money 'trickles down' has been proven wrong.[16]

What prevents economic growth from being more equitable? Some experts point to problems of housing affordability and the segregation of housing markets.[17] Others highlight the concentration of resources among capital owners and the decreasing share of income received by labor.[18] Also

[8] Alberto Alesina and Dani Rodrik, "Distributive Politics and Economic Growth," *Quarterly Journal of Economics* 109, no. 2 (1994): 465-490; Simplice Asongu and Rangan Gupta, "Trust and Quality of Growth: A Note," *Economics Bulletin* 36, no. 3 (2016): 1854-1867; IMF, *Fostering Inclusive Growth: G-20 Leaders' Summit* (IMG, June 26, 2017); Stoknes, *Tomorrow's Economy*, 150.
[9] Kate E. Pickett and Richard G. Wilkinson, "Income Inequality and Health: A Causal Review", *Social Science & Medicine* 128 (March 2015): 316-326; Richard G. Wilkinson and Kate E. Pickett, "The Enemy between Us: The Psychological and Social Costs of Inequality," *European Journal of Social Psychology* 47, no. 1 (2017): 11-24; Richard G. Wilkinson and Kate E. Pikett, "Income Inequality and Social Dysfunction," *Annual Review of Sociology* 35, no. 1 (August 2009): 493-511; Hector Rufrancos and Madeleine Power, "Income Inequality and Crime: A Review and Explanation of the Timeseries Evidence," *Sociology and Criminology-Open Access* 1, no. 1 (2013).
[10] Facundo Alvaredo et al., *World Inequality Report 2018* https://en.unesco.org/inclusivepolicylab/sites/default/files/publication/document/2018/7/wir2018-full-report-english.pdf.
[11] Cingano, "Trends in Income Inequality and its Impact on Economic Growth," 6.
[12] Stoknes, *Tomorrow's Economy*, 41-43.
[13] Andrew Cumbers, *The Case for Economic Democracy* (Great Britain: Polity Press, 2020), 43.
[14] Benner and Pastor, *Solidarity Economics*, 85.
[15] Benner and Pastor, *Solidarity Economics*, 85.
[16] Joseph E. Stiglitz, *The Price of Inequality* (New York: Norton & Company, 2013); Jonathan David Ostry, Andrew Berg, and Charalambos G. Tsangarides, *Redistribution, Inequality, and Growth* (IMF Staff Discussion Note, February 2014); Thomas Piketty, "Toward a Circular Economy," October 15, 2019, in *Time for Socialism: Dispatches From a World On Fire, 2016-2021* (Great Britain: Yale University Press, 2021), 257-261.
[17] Jan Nijman and Yehua Dennis Wei, "Urban inequalities in the 21st century economy," *Applied Geography* 117 (April 2020), https://doi.org/10.1016%2Fj.apgeog.2020.102188; Emma Baker et al., "Housing affordability and residential mobility as drivers of locational inequality," *Applied Geography* 72 (July 2016), https://doi.org/10.1016/j.apgeog.2016.05.007.
[18] Thomas Piketty, *Capital in the Twenty-First Century*, trans. Arthur Goldhammer (Cambridge, Massachusetts: Harvard University Press, 2014); Marta Guerriero, "The Labor Share of Income around the World: Evidence from a Panel Dataset," ADBI Working Paper 920 (February 1, 2019); Eoin Flaherty and Sean O Riain, "Labour's Declining Share of National Income in Ireland and Denmark," *Socio-Economic Review* 17, no. 2 (2019); ILO and OECD, *The Labour Share in G20 Economies* (Report Prepared for the G20 Employment Working Group, Antalya, Turkey, February, 2015).

cited are real estate speculation and private ownership of land rents; regressive taxes; insufficient funding for public infrastructure and social programs; debt crises exacerbated by financialization; poor urban planning; automation, offshoring, and hyperglobalization; and incomplete metrics of growth which mislead policymaking. The practices proposed in this paper aim to address these issues at the city level, prioritizing systemic change over symptomatic treatment.

Further, not only is this economic growth not equitable, it is also not green. In recent history, most cities have run almost entirely on coal, oil, and gas. 70% of all human emissions come from cities, even though only 55% of humans live there and cities cover only 2% of the Earth's surface.[19] The modern economy grows at the expense of our planet: depleting the lands, acidifying the oceans, fogging the skies, destabilizing the climate, and pushing wildlife toward extinction.[20] Since the 1970s, there has been a 60% decline in wildlife populations as more natural areas have been claimed to feed our growth.[21] *The Inclusive Wealth Report 2018* found that from 1992 to 2014, economic growth in 44 out of 140 countries overconsumed their natural capital, meaning that they suffered a decline in their overall wealth, leaving future generations worse off.[22] If everyone adopted the consumption patterns of the richest nations today, then we would need the biocapacity of around 3 to 5 planets.[23] With global surface temperatures on track to increase 3°C relative to pre-industrial times, we are already facing environmental catastrophes more frequently.[24]

Any solution to the inequality crisis is insufficient if cities and their economies continue to grow unsustainably. Many economists say that it is not even possible to resolve environmental challenges unless we reduce inequality.[25] Potential solutions which focus on economic 'degrowth' will not be effective in many situations, as we need economic growth to support the increasing global population, especially in less developed countries. Trying to halt growth would cause economies to collapse, unemployment to skyrocket, debts to deepen, and poverty and inequality to threaten the social fabric. Achieving global sustainability goals would be impossible under such conditions.

Likewise, the solution is also not to attempt to eradicate all differences in people's income and wealth—that, too, would be unfair, and has led to the deadly failures of the Soviet Union and other socialist authoritarian regimes. Instead, we should focus on reducing the worst forms of inequality in cities which ravage society, damage growth, and poison the environment. Rather than casting aside

[19] Stoknes, *Tomorrow's Economy*, 89; United Nations, Department of Economic and Social Affairs, *World Urbanization Prospects: The 2018 Revision* (New York, NY: UN, 2019), 1, https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf.
[20] L. Laybourn-Langton et al., "This Is a Crisis: Facing up to an Age of Environmental Breakdown" (London: Institute for Public Policy Research, 2019); G. Ceballos, P. R. Ehrlich, and R. Dirzo, "Biological Annihilation via the Ongoing Sixth Mass Extinction Signaled by Vertebrate Population Losses and Declines," *PNAS* 114, no. 30 (25 July 2017).
[21] World Wildlife Fund, *Living Planet Report–2018: Aiming Higher* (Gland, Switzerland, 2018).
[22] Shunsuke Managi and Pushpam Kumar, *Inclusive Wealth Report 2018: Measuring Progress towards Sustainability* (New York: Routledge, 2018), 15.
[23] Stoknes, *Tomorrow's Economy*, 105.
[24] UN Environmental Programme, Emissions Gap Report 2019, https://www.unenvironment.org/resources/emissions-gap-report-2019.
[25] Thomas Piketty, "After the Climate Denial, the Inequality Denial," *Time for Socialism: Dispatches From a World On Fire, 2016-2021* (Great Britain: Yale University Press, 2021), 272-275; Stoknes, *Tomorrow's Economy*.

growth-oriented capitalism, we must rethink it to be fairer and more sustainable. This will enable us to generate the high growth needed to support our increasing global population and expanding cities.

## 1.2 Economic innovation is key to the sustainable, livable, and affordable city

The key issue is how to reshape a diverse set of capitalist systems to serve society and restore nature. We need an economy which specializes in improving social and resource productivity (See 2.1). Ultimately, this amounts to establishing a more healthy and dignified relationship between us, the economy, and the environment. One source of inspiration could be the Seneca Nations, which is said to have made decisions not just thinking of themselves or the next generation, but "on behalf of the seven generations coming, so that they may enjoy what [we] have today."[26] As a city *for* the future, how can Spectra help create a future that our great-great-grandchildren will want to live in?

Spectra believes in pluralist cooperative systems which drive equitable and sustainable growth from the block layer upward. This paper addresses the urban economics part of that framework. Through healthy growth, we can boost developing economies to the forefront of the twenty-first century and save the planet from climate catastrophe. Through cooperativism we can link value creation with value distribution, and retain the benefits of competition while also banding together to increase our resilience during hardships. Through housing abundance, we can establish the foundation for a thriving urban society.

We recognize the boldness of our proposal. To build a new city is already ambitious. To design a new economy in order to build that city (and others like it) to be sustainable, livable, and affordable is a feat which extends far beyond any one organization. Yet, we believe Spectra has the potential to create ripple effects toward achieving sustainable development goals. Through healthy economic growth and multilayered cooperative institutions to support it, we can still make it to that more beautiful and fair future world.

[26] Benner and Pastor, *Solidarity Economics*, 131, 137.

# 2 Healthy Growth

Building a sustainable, livable, and affordable city requires remedying the intersectional inequalities and environmental degradation which accompany traditional urbanization. This chapter lays out the first set of practices which Spectra proposes to reshape urban economics. Over the next several chapters, we frame our ten proposals for Spectra as 'practices' because they are exercises of our agency as (future) city residents, reframing our economy and city as ones of our own creation.[27]

## 2.1 Healthy growth metrics (#1)

**Economic growth is crucial, but how we measure it needs fixing. Metrics for healthy growth must also consider gains in social and resource productivity. The world needs a lot of genuine fair and green growth to meet global sustainable development goals on time. While metrics alone won't solve any problems, they are undeniably important.**

Modern economics consistently emphasizes growth (measured by GDP) above all else. Since at least as early as the mid-1900s, the general assumption has been that economic growth is the most important process to ensure the long-term success of nations.[28] Growth is very important, but this creates a precarious situation because how we think about growth is outdated and inadequate.[29]

Specifically, the exogenous growth theory pioneered by Robert Solow in 1956 excluded a key variable: land.[30] Classical economists, such as Adam Smith and David Ricardo, understood growth as a function of labor, capital, and land. Solow's theory instead emphasized labor, capital, and technological progress, stating that, "One can imagine the theory as applying as long as arable land can be hacked out of the wilderness at essentially constant cost."[31] Today, we know this was only a fantasy which influenced generations of economists to be "blind to both material wastefulness and the state of the natural world."[32] An economic ideology which excludes environmental impact and the depletion of resource wealth is broken.

[27] For related framings of the economy and society as practice, see Aaron Sahr, *Keystroke Capitalism: How Banks Create Money for the Few*, trans. Sharon Howe, 2017, (London: Verso, 2022); Talja Blokland, *Community as Urban Practice* (Great Britain: Polity Press, 2017); Benedict Arnold, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (New York: Verso, 1983).
[28] Robert M. Solow, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics* 70, no.1 (1956): 65-94; Stoknes, *Tomorrow's Economy*, 37; Paul A. Samuelson and William D. Nordhaus, *Economics*, 19th ed. (Boston: McGraw-Hill Irwin, 2010); World Bank and Commission on Growth and Development, *The Growth Report: Strategies for Sustained Growth and Inclusive Development* (Washington, DC: World Bank on behalf of the Commission on Growth and Development, 2008).
[29] Piketty, "After the Climate Denial, the Inequality Denial," 272-275.
[30] As in Section 4.1, 'land' is natural resources, or more simply nature. For more on the growth model referred to, see Solow, "A Contribution to the Theory of Economic Growth."
[31] Written in a footnote in Solow, "A Contribution to the Theory of Economic Growth," 67.
[32] Stoknes, *Tomorrow's Economy*, 107.

Despite being the primary measure of how *well* our economy is doing, GDP includes things which should not be in any measure of *good* growth. For example, exorbitantly high medical, healthcare, and drug costs in the United States increase GDP. Weapons manufacturing and other activities from warfighting also increase GDP. So do car sales in a city already suffering from congestion and smog. As well as the oil fracking to power those cars. Should things which are killing us—directly or indirectly—really be accounted for positively? Even GDP per capita becomes less accurate for assessing socioeconomic development past about $40 per day, as the benefits from economic growth become concentrated among a smaller percentage of the population.[33]

As such, Spectra promotes a revamped understanding of growth. The goal of growth should be to continually improve human well-being while fitting the economy's footprint within planetary boundaries. If growth widens inequality, it is not fair. If growth damages the environment, it is not green. Economic growth is healthy when value creation gets sufficiently more socioeconomically inclusive and resource efficient every year. To quantify healthy growth, we borrow measurements and equations from environmentalist, economist, and politician, Per Espen Stoknes.[34]

**Value added** is the monetary value of all newly generated goods and services less the value of all goods and services consumed in their creation, in dollars. **Gross product (G)** is the total economic activity, or the value added of all final goods and services produced within the city. **Economic growth (*g*)** is the rate of change in gross product in % per year.

Regarding fairness, the **Palma ratio** is the share of national income captured by the richest 10% of the population divided by the share of the national income captured by the poorest 40%.[35] If the former exceeds the latter, then the Palma ratio is higher than 1.0.[36] The Palma ratio seems to be a psychologically tolerable level of inequality conducive of trust and well-being. It is unsurprising then that Sweden, Denmark, Finland, and Norway all have Palmas around or below 1.0 and enjoy higher rankings in human development, happiness, and quality of life than in the United States, which had a Palma ratio of 1.81 in 2019 and suffers from deep institutional distrust.[37]

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[33] Stoknes, *Tomorrow's Economy*, 143.

[34] Stoknes originally devised these measurements for the country level. We apply them now to the city. Stoknes, *Tomorrow's Economy*.

[35] Economist Gabriel Palma found that middle-class incomes often represent about half of gross national income while the other half is split between the poorest 40% of people and the richest 10% of people. It is the shares of the poorest and richest which vary the most across countries. Jose Gabriel Palma, "Globalizing Inequality: 'Centrifugal' and 'Centripetal' Forces at Work" (DESA working paper 35, United Nations, 2006); Jose Gabriel Palma, "Homogeneous Middles vs. Heterogenous Tails, and the End of the 'Inverted-U': It's All about the Share of the Rich," *Development and Change* 42, no. 1 (2011): 87-153; Alex Cobham and Andy Summer, "Putting the Gini Back in the Bottle? 'The Palma' as a Policy-Relevant Measure of Inequality" (London: King's College London, March 15, 2013).

[36] Another well-known metric of inequality is the Gini scale. It ranges from 0 to 1, with 0 meaning exact equality across the population, and 1 meaning that one person gets everything (or absolute inequality). However, it is difficult for the average person to understand what Gini scores mean since the calculation is complicated and results in decimals in the thousandths which still do not directly compare how the richest and poorest relate.

[37] Palma ratios by country and year can be viewed at https://dashboards.sdgindex.org/map/indicators/palma-ratio/values. Jeffrey Sachs et al., *Sustainable Development Report 2022* (Cambridge: Cambridge University Press, 2022); John F. Helliwell, Richard Layard, and Jeffrey Sachs, *World Happiness Report 2019* (New York: Sustainable Development Solutions Network, 2019).

$$Palma\ Ratio = \frac{Income_{Top10\%}}{Income_{Bottom40\%}}$$

**Social productivity (SP)** is the value added, in dollars, divided by inequality (as measured by the Palma ratio) for any period. ***sp*** is the rate of change in SP in % per year. **Fair growth** is $sp > g$, or when social productivity growth is greater than economic growth. Though, not just any *sp* is enough to sustain growth and reduce inequality in the long run. Stoknes advises that genuine fair growth requires $sp > 5\%$, and that any economy with a Palma over 1.5 should aim to halve disposable income inequality by 2050.[38] The goal is certainly not to have everyone earn the same, but rather to avoid the rampant inequality which makes everyone worse off by threatening political stability, weakening economic growth, and more (See 1.1).

$$Social\ productivity = \frac{Gross\ product}{Palma\ Ratio}$$

$$Fair\ growth = \Delta Social\ productivity > \Delta Gross\ product$$

$$Genuine\ fair\ growth = \Delta Social\ productivity > 5\%$$

Further breaking down SP along dimensions of race, gender, sex, or other identities could refine fair growth metrics with intersectionality in mind. For example, comparing *sp* across cisgender White men and transgender BIPOCs (Black, Indigenous, People of Color) could highlight potential differences between the rates of change in inequality among different groups of Spectrans. These insights could help shape economic practices which are aimed to support marginalized populations.

Regarding greenness, **environmental footprint (EF)** is the impact of economic activities on the environment, measured in either tons (t) per year or global hectares (gha) per year. Depending on the situation, EF can refer to carbon footprint (greenhouse gas emissions in tons), material footprint (consumption of biomass, fossils, metals, and minerals added together in tons), or ecological footprint (global hectares of biocapacity).[39]

$$Environmental\ footprint = tCO_2\ \ or\ \ gha$$

**Resource productivity (RP)** is the value added, in dollars, divided by the environmental footprint for any period, measured in $tCO_2$ or gha. ***rp*** is the rate of change in RP in % per year. **Green growth** is $rp > g$, or when resource productivity growth is greater than economic growth. Though, not just any *rp* is sufficient to meet global sustainability targets by 2050. For example, a global average ***cp*** (the portion of *rp* measured in greenhouse gas emissions, $tCO_2$) higher than 5% yields a

[38] Stoknes, *Tomorrow's Economy*, 183.
[39] Global hectares (gha) represent an average area of land and sea that can produce and regenerate what sustains us. The Earth has twelve billion global hectares in total, meaning about 1.5 gha per person for our current 7.8 billion population.

reasonable likelihood for reaching the Paris Climate Agreement's 2℃ target.[40] The same result arrives directly from doubling global GDP while at least halving emissions. Genuine green growth requires *rp* > 5%.[41]

$$Resource\ productivity = \frac{Gross\ product}{Environmental\ footprint}$$

$$Green\ growth = \Delta Resource\ productivity > \Delta Gross\ product$$

$$Genuine\ green\ growth = \Delta Resource\ productivity > 5\%$$

Combining fairness and greenness, **healthy growth** is *sp* > 5% and *rp* > 5% each year. It is growth which prioritizes people, planet, and profits. Rather than maximizing technological progress, labor productivity, or economic growth alone, as in the twentieth century, success in the twenty-first depends on both social and resource productivity growth.

$$Healthy\ growth = \Delta Social\ productivity > 5\%\ \ and\ \ \Delta Resource\ productivity > 5\%$$

These metrics can be scaled from city to company to cooperative.[42] In Spectra, each physical city should track the fairness and greenness of its economic activities. How does the disposable income distribution look? What is the environmental footprint? Are these statistics improving faster than the city's economic growth? Companies should ask similar questions about raising the social and resource productivity of their business operations. Block cooperatives should consider their role in financing projects which will improve equitable outcomes as well as designing their built environment to be net zero carbon. At the world layer, virtual activities—such as server hosting, minting tokens, and transacting—should optimize their energy consumption.

Other metrics which Spectra could adopt to supplement its understanding of healthy growth include the Genuine Progress Indicator (GPI);[43] Human Development Index (HDI) and Multidimensional Poverty Index (MPI);[44] and Gross National Happiness (GNH).[45] Private debt per capita could also help diagnose the quality of investments and returns, as it is important that metrics capture any dynamic spillovers that come from innovation.

[40] For context, the global average carbon productivity (CP) was 2.2 $/kg (GDP/kg $CO_2$) in 2015. In the US, it was 2.7 $/kg; in the EU, 4.1 $/kg; in China, 1.4 $/kg; and in Sweden, 6.6 $/kg. The global average CP needs to grow to at least 12 $/kg by 2050 to achieve the 2℃ target, or ideally 24 $/kg or higher for the 1.5℃ target. Stoknes, *Tomorrow's Economy*, 176.
[41] Achieving the more desirable 1.5℃ target requires rp > 7%.
[42] Spectrans should focus on improving the healthiness of the activities fully under their control, before moving on to the inputted energy and resources from other organizations along their supply chains.
[43] Clifford Cobb, Ted Halstead, and Jonathan Rowe, "The Genuine Progress Indicator: Summary of Data and Methodology" (San Francisco, CA: Redefining Progress, 1995); Günseli Berik, "Measuring What Matters and Guiding Policy: An Evaluation of the Genuine Progress Indicator," *International Labour Review* 159, no. 1 (2020): 71-94.
[44] The former was developed by the United Nations Development Programme (UNDP) and the latter by both the UNDP and the Oxford Poverty & Human Development Initiative.
[45] GNH is used by the government of Bhutan to guide the country toward a "just and harmonious society." Center for Bhutan Studies & GNH Research, "A Compass Towards a Just and Harmonious Society: 2015 Gross National Happiness Survey Report," Center for Bhutan Studies & GNH Research, 2016.

## 2.2 Healthy growth hub (#2)

**Cities are economic hubs, but their growth is not always fair and green. Specializing as a healthy growth hub activates the 21st century economy we need. Whereas New York City has finance and San Francisco has software development, Spectra can be a hub for healthy growth firms innovating in renewable energy, smart transportation, virtual citymaking, circular waste systems, sustainable food chains, healthcare technology, education, and more. With this type of innovation, new cities can be built with smaller environmental footprints and better social impacts to boost developing economies and reform our societies.**

Cities lead global economic growth (See 1.1). Especially, dense, mixed use cities (See 4.2) with housing abundance (See 4, 4.1). The key is to have this growth be healthy by attracting the right types of firms to Spectra's physical city and virtual world. Firms in sectors which are primed for transformational innovation within the next decade and will help us attain the high levels of growth needed to achieve global sustainable development goals. Firms which specialize in the research, development, and production of goods and services that improve social and resource productivity (See 5.2). Firms which stand to benefit from the agglomeration effects and economies of scale that would exist in a city of one million people (See 4.2), and an extended network of even more.

Cities are moving into the foreground of climate action. With sufficient investment, they can lead the transition toward low-carbon lifestyles and a circular economy.[46] Investing in firms in the smart energy, food, transportation, health, and education sectors could reduce waste, disconnect growth from resource consumption, and spur industrial renewal.[47] Making sure that the labor and natural materials which are used are supplied/sourced ethically and replenished where possible would lessen the negative effects of digital economic transition on people and planet.[48] Spectra's innovations in virtual citymaking and VR-based community development, in particular, are excellent examples of how to improve social and resource productivity in urban planning.

Despite the market share of sustainable products being low historically—for example, about 15% of the total US consumer goods market—it grew rapidly during the 2010s. The annual dollar share of sustainability-marketed products grew from 14% to 17% from 2013 to 2018. Those figures may seem small, but it means that sales grew by nearly 20% over those years. In 2018, specifically,

[46] Stoknes, *Tomorrow's Economy*, 200; Harold Fuhr, Thomas Hickmann, and Kristine Kern, "The Role of Cities in Multi-Level Climate Governance: Local Climate Policies and the 1.5 C Target," *Current Opinion in Environmental Sustainability* 30 (February 2018): 1-6; Luis Gomez Echeverri, "Investing for Rapid Decarbonization in Cities," *Current Opinion in Environmental Sustainability* 30 (February 2018): 42-51; William Solecki et al., "City Transformations in a 1.5C Warmer World," *Nature Climate Change* 8, no. 3 (March 2018): 177-181.

[47] Kate Raworth, *Doughnut Economics: Seven Ways to Think like a 21st-century Economist* (White River Junction, VT: Chelsea Green Publishing, 2017); Carlota Perez, "Transitioning to Smart Green Growth: Lessons from History," in R. Fouquet, ed., *Handbook on Green Growth* (Cheltenham: Edward Elgar, 2019): 447-463.

[48] Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (New Haven: Yale UP, 2021).

there was a 5.8% growth rate for sustainable products compared to 0.4% for conventional products. Sustainable products are where the big growth is.[49]

Looking at global development trajectories, it's clear that the Global South won't be able to develop along the same path as the Global North. Emulating the gray growth of the industrial era would be environmentally perilous for countries with rapidly growing populations. Yet, economic growth will be crucial as city populations grow by an additional 1.5 billion people over the next ten to fifteen years. Whereas many Global North countries have been hesitant to invest into healthy growth sectors, such as green energy, for political reasons, this is a huge opportunity for Global South countries. As it is highly likely that one of these developing countries will be the future host of Spectra's physical city(ies), our healthy growth hub could greatly elevate their economic status.

Healthy growth at the city layer is the aggregate of smaller changes made by cooperatives, companies, and other organizations. As such, many business models could contribute to healthy growth. One example to improve the social productivity of growth is Salesforce's 1-1-1 integrated philanthropy model. By pledging 1% of its products, time, and resources, Salesforce has given more than $240 million in grants, 3.5 million hours of community service, and provided product donations for more than 39,000 nonprofits and educational institutions since its founding.[50]

Many examples of improving resource productivity come from Norway.[51] Finnfjord, one of the world's largest producers of ferrosilicon (used in steel manufacturing), now uses recaptured waste heat from its metallurgic process to cover 40% of total energy needs in production. Their investment paid for itself in less than 5 years. Norcem, Norway's largest producer of cement, has similarly—and profitably—reduced its emissions by 40% for each ton of cement by burning landfill-bound waste for energy instead of coal and mixing fly ash (otherwise a waste product) into the cement to improve it. In addition to other emission-reducing innovations, cured concrete itself absorbs some C02 from the air over time, so the concrete may even become net-positive. Kebony, a wood processing company, is dedicated to stopping illegal rainforest logging by providing sustainable options from responsibly harvested forests. They treat ordinary pine wood with products derived from organic wastes to make it look just like teak, while being nontoxic, durable, and resistant to rot and fungi. With innovations like these, new cities can be built with smaller environmental footprints and thriving economies.

In Spectra, business-oriented blocks and clusters could be composed of one or more healthy growth firms, encouraging cooperative-public-private partnerships between smaller firms to create economies of scale. Some could even be licensed as limited cooperative associations (LCAs) or public

[49] Stoknes, *Tomorrow's Economy*, 240; Anne Oudersluys, "5 Insights Every Brand Should Know about the Sustainable Shopper, from Nielsen's Latest Sales Data," Core Impact–Social Impact & Purpose Driven Marketing, February 2019, https://www.coreimpactstrategy.com/blog1/5-insights-on-sustainable-consumer; Randi Kronthal-Sacco et al., "Sustainable Purchasing Patterns and Consumer Responsiveness to Sustainability Marketing," *SSRN 3465669* (August 2019).
[50] "Pledge 1%," Salesforce, https://www.salesforce.org/about/pledge/.
[51] Stoknes, *Tomorrow's Economy*, 229, 233.

benefit cooperatives/corporations (PBCs) to give "legal teeth" to the people-planet-profits stakeholder capitalism model.[52] Globally, there are more than 6,000 benefit corporations (almost 500,000 workers) in 86 countries and 158 industries.[53] Over 4,000 of these are Certified B Corps which have met verified standards of social and environmental impact, committed to transparency requirements related to their business' impact and operations, and committed to being legally accountable to all of their stakeholders.[54]

Spectra has a clear direction to head in: healthy growth. Our ability to move in that direction will be the lynchpin of our mission's success (See 5.2, 5.3). It will require collaboration, long-term investment, and experimentation by many actors to foster cross-sectoral innovation. Jacobs said it best when she described the city as "an immense laboratory of trial and error, failure and success."[55] The same is true for creating a healthy growth hub. The Spectra community will launch thousands of experiments on the way to building a sustainable, livable, and affordable city. Some experiments will succeed, and many will likely fail, but as Mazzucato says when recounting the bold mission which got mankind to the moon, "Innovation and the commercialization of ideas do not happen because you want them to: they happen along the way to solving bigger problems."[56]

[52] Jacqueline Radebaugh and Yev Muchnik, "Exclusive Report: Solving the Riddle of the DAO with Colorado's Cooperative Laws," The Defiant, https://thedefiant.io/solving-the-riddle-of-the-dao-with-colorados-cooperative-laws; "People, planet, profits" was coined by sustainability expert John Elkington in the 1990s as an alternative to stockholder capitalism.
[53] B Lab, https://www.bcorporation.net/en-us.
[54] B Lab, https://www.bcorporation.net/en-us/faqs/how-many-certified-b-corps-are-there-around-world.
[55] Jane Jacobs, *The Death and Life of Great American Cities* (1961; reis., New York: Vintage Books, 1992), 6.
[56] Mariana Mazzucato, *Mission Economy: A Moonshot Guide to Changing Capitalism* (Great Britain: Penguin Books, 2021), 62.

# 3 Cooperativism

The wealth we generate should go to all those who contribute. Organizing cooperatively integrates more stakeholders into the compensation scheme. This offers a predistributive (*ex ante*) method of rewarding hard work fairly and preventing extreme inequalities from the start. While redistributive (*ex post*) methods, such as taxes and social programs, are also vital to correcting inequalities which slip through, predistribution is a more symbiotic way for economic actors to relate, collaborate, and share.[57] This chapter reviews Spectra's **multilayer cooperative structure** which was first introduced in the Whitepaper. It also addresses how we expect tokens to fit into this structure as a way for profits to be shared cooperatively as the project grows.

## 3.1 Multilayer cooperative structure (#3)

**Cooperativism links value creation with value distribution. It nurtures healthy competition, bolsters collective resilience, aligns group economic incentives, and rewards hard work with fair compensation. Adapting traditional cooperativism with modern technology enables pooling the community's resources, energy, and ideas with trust, efficiency, and global reach.**

*"If you want to go fast, go alone. If you want to go far, go together."*[58]

A cooperative is "an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through jointly-owned and democratically-controlled enterprise."[59] Cooperatives can be composed of workers, consumers, producers, residents, or multiple types of stakeholders.

There are 3 million cooperatives around the world with 1.2 billion members (12% of the human population) and they have found success in just about every country.[60] In 2017, the top 300 earning cooperative enterprises had a total combined turnover of over $2 trillion.[61] In the UK, more than 7,000 cooperatives contribute £39.7bn to the economy, and 72% of cooperatives survive the first five years of business compared to only 43% of companies.[62] In New York City, cooperatives make up

[57] For more on predistribution, see Mazzucato, *Mission Economy*.
[58] Origin unknown, but often cited as a West African proverb. Benner and Pastor, *Solidarity Economics*, 37.
[59] International Cooperative Alliance, "Cooperative identity, values & principles," accessed 13 March 2022, https://www.ica.coop/en/whats-co-op/co-operative-identity-values-principles.
[60] ICA, "Cooperative identity, values & principles."
[61] ICA, "The World Cooperative Monitor," accessed 14 March 2022, https://www.ica.coop/en/our-work/world-cooperative-monitor.
[62] Co-operatives UK, "Quick facts about co-ops," accessed 14 March 2022, https://www.uk.coop/understanding-co-ops/what-co-op/quick-facts-about-co-ops.

almost 75% of Manhattan's apartment stock.[63] The success of kibbutzim and moshavim in Israel, the Mondragon group in Spain (Basque Country), the John Lewis Partnership in the UK, REI in the US, and others demonstrates how greater equality can be a stimulus of growth.[64]

A cooperative economy goes further toward recognizing all the agents who contribute to innovation and economic growth. It fairly compensates the vital contributions of unpaid and underpaid labor, including domestic work, childcare, food service, and others. As Benner and Pastor describe in one way of many, "Behind every software engineer is a village of nannies, gardeners, and food service workers tending to their local needs."[65] During the COVID-19 crisis it was these workers—garbage collectors, postal staff, hospital cleaners, care workers, grocery store cashiers, bus drivers—whom society deemed "essential workers" and depended on the most.[66] Cooperativism links value creation with value distribution.

Similarly, many decentralized autonomous organizations (DAOs) use blockchain technology to pool resources, energy, and ideas with trust, efficiency, and global reach. For some, DAOs are an adaptation of cooperativism given the availability of new technology.[67] Many DAOs have formed to design a mix of new cooperative, co-living, autonomous, and even sovereign communities. Cabin is a collection of co-living properties building a 'network city' tied together by a shared culture, community, economy, and governance.[68] Cohere is a member-owned network of co-living communities aiming to have a regenerative impact on their local economies and environments.[69] Build_Cities seeks to establish the infrastructure to create, finance, and govern 'startup cities' around the world.[70] In Colorado, a relatively new class of limited cooperative associations (LCAs) could offer a legal framework for DAOs to commit to their cooperative values in a practical way.[71]

Spectra builds on the precedents of traditional cooperatives and DAOs to create a multilayer structure of blockchain cooperatives which is organized at the block, cluster, city, and world layers to simultaneously address localized and global needs. Spectra's cooperatives, especially at the block layer, are our instrument to enable the economic growth which comes from balancing individualistic

[63] Susan Stellin, "Co-op vs. Condo: The Differences Are Narrowing," The New York Times, 5 October 2012, accessed 17 March 2022, https://www.nytimes.com/2012/10/07/realestate/getting-started-choosing-between-a-co-op-and-a-condo.html; Cait Etherington, "How co-ops became the housing option of choice for New Yorkers," CityRealty, 10 February 2022, accessed 17 March 2022, https://www.cityrealty.com/nyc/market-insight/features/get-to-know/how-co-ops-became-housing-option-choice-new-yorkers/20423.

[64] OECD, *In It Together: Why Less Inequality Benefits All* (OECD, 2015); IMF, *Fostering Inclusive Growth: G-20 Leaders' Summit* (IMG, June 26, 2017); Jonathan David Ostry, Andrew Berg, and Charalambos G. Tsangarides, *Redistribution, Inequality, and Growth* (IMF Staff Discussion Note, February 2014).

[65] Benner and Pastor, *Solidarity Economics*, 88.

[66] Mazzucato, *Mission Economy*, 14.

[67] "Kelsie Nabben et al., "Grounding Decentralised Technologies in Cooperative Principles: What Can 'Decentralised Autonomous Organisations' (DAOs) and Platform Cooperatives Learn from Each Other?" (Working paper, Platform Cooperative Consortium Conference, 2021), https://dx.doi.org/10.2139/ssrn.3979223.

[68] Cabin, https://www.cabin.city.

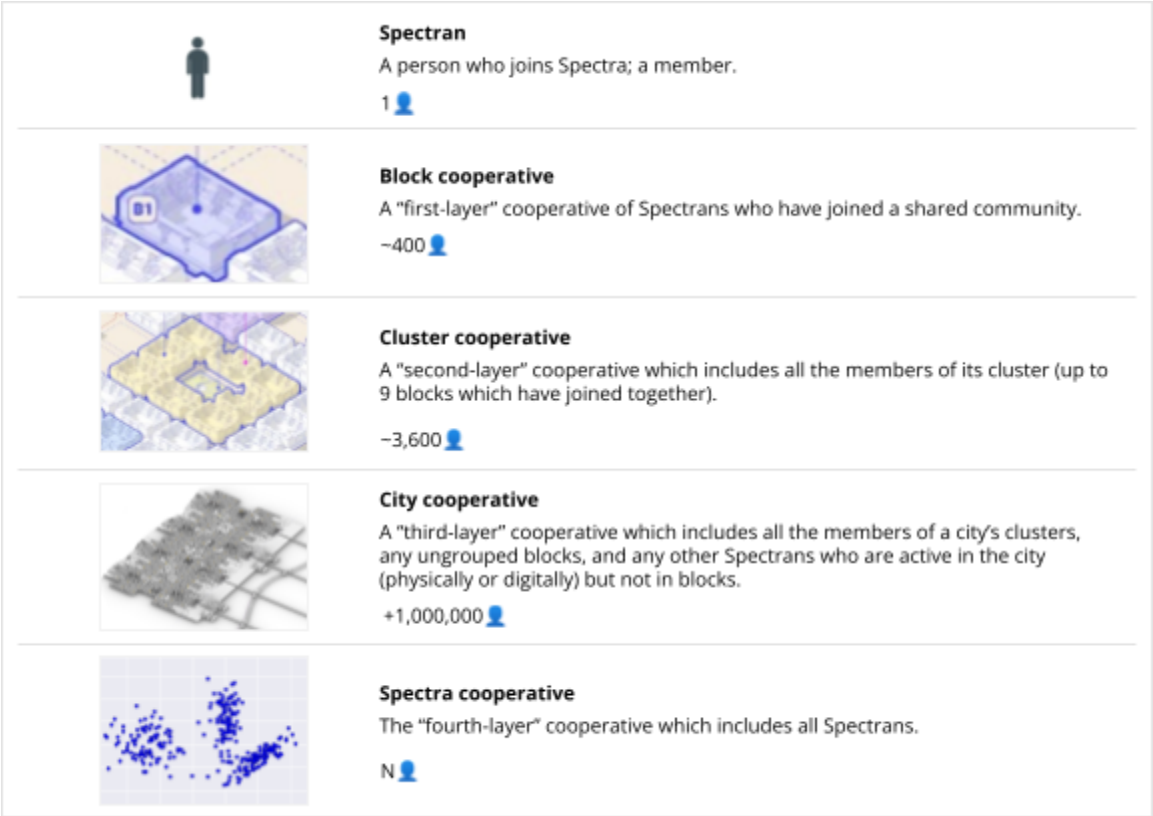
[69] Cohere, https://www.cohere.network.

[70] Build_Cities, https://www.buildcities.network.

[71] Radebaugh and Muchnik, "Exclusive Report: Solving the Riddle of the DAO with Colorado's Cooperative Laws."

and collaborative economic behavior. People are both individuals motivated by self-interest as well as members of social groups and communities motivated by care for others and desire for belonging. The key, then, is designing incentive structures which tie these motives together.

In Spectra, people will form and join block cooperatives for different reasons: to live in a more connected space with friends and family; to form unique communities for artistic pursuits or scientific research; to practice sustainable lifestyles; to seek new economic opportunities. Achieving individual goals is intertwined with achieving common goals, aligning incentives toward cooperation. This will motivate members to contribute to Spectra and participate in its governance. The cooperative ownership of land at the cluster layer and land value at the city layer (See 4.1, 5.1), as well as the introduction of tokens at the block and Spectra-wide layers (See 3.2), will further align these incentives as valuation becomes based on common assets. Our aspiration is that such a multilayered community has "the potential for the cooperation that shelters us from storms, while nurturing the competitive creativity of progress" and pluralism.[72]




## 3.2 Multilayer tokens (#4)

[72] John Kay and Paul Collier, *Greed is Dead: Politics After Individualism* (Great Britain: Penguin Books, 2021), 99-100.

**Tokens are a member's stake in Spectra and compensate for their contributions. Tokens accrue value over time to reward individuals in the multilayer cooperative structure. By owning tokens, members own a part of Spectra and its assets.**

Spectra will need a sophisticated economy to facilitate the development and decision-making of the multilayer cooperative structure (block, cluster, city, and world), virtual world, and physical city. In order to meet these complex needs, Spectra will use blockchain as one of its foundational technologies and cryptocurrencies as its units of trade.[73]

The practice of using digital currencies is more common than most people realize. As Floridi explains, "On any sterling banknote, one can still read 'I promise to pay the bearer on demand the sum of…', but the fact is that Britain abandoned the gold standard in 1931, so you should not expect to receive any precious yellow stuff in exchange. The euro, you may notice, promises absolutely nothing. Since currencies are free-floating nowadays, money may as well be just a pile of digits."[74] Fidelity cards, loyalty programs, and mileage programs all provide precedent for using digital points (essentially, monies) to make new purchases. According to the Economist, by January 2005 the total stock of unredeemed miles was already worth more than all the dollar bills in circulation, and you can exchange them for almost anything.[75]

In Spectra, blocks will need a token which allows them to efficiently coordinate financial decisions, stake into their projects from anywhere in the world, earn fair compensation for hard work, and share profits from growth. The supply of block-specific tokens may be preset upon launch to a default set of rules which can later be amended by vote as needed by block cooperatives, as the goals and needs of block cooperatives will likely vary.

The physical city will need a stable currency which fits into the regional economy of its host country and can be used for daily transactions, while still being easily exchangeable for the block and virtual world currencies. Cities may choose to adopt an existing stable coin, or create local tokens as capital enters the city layer through the land auction and subsequent payments/investments into the physical city.

There will also be a Spectra-wide token to coordinate finances across the entire cooperative, such as raising a fund to acquire land, employing committee members, investing in projects, and incentivizing participation. This token will address the virtual world's unique tasks too, such as the

[73] Despite the environmental unsustainability of some preceding use cases of cryptocurrencies (e.g. Bitcoin), the technology is becoming increasingly eco-friendly as new blockchains are being created with sustainability as a core principle (e.g., Solana, PoS Ethereum).
[74] Luciano Floridi, *The Fourth Revolution: How the Infosphere is Reshaping Human Reality* (New York: Oxford University Press, 2014), 46.
[75] The Economist, "Frequent-flyer miles—funny money," *The Economist*, 20 December 2005, https://www.economist.com/special-report/2005/12/20/funny-money.

cost of hosting blocks on servers. Some decision-making processes may also require tokens for certain voting mechanisms.

At the cluster level, there will be no unique tokens. The cluster is a unit of organization and governance. The coordination and management of finances at the cluster level can be done through voting systems using other tokens (block, city, or Spectra network). The Treasury will also include a Community Fund to provide financial support across Spectra's multilayer structure (See 5.3).

# 4 Housing Abundance

The city grows from the home. We learned in elementary school that food, water, and shelter are the three essential needs to live. People cannot survive without them. Though, in many parts of the world, people cannot afford to survive after paying for their shelter. From New York City to Hong Kong to São Paulo, a brief look at housing markets reveals how dire economic inequality is.

In the United States, the value of housing capital stock is larger than the value of all business equipment and structures.[76] Yet, more than 30% of US households (~37.1 million households) are cost-burdened, or spending more than 30% of income on housing.[77] 17.7 million of these are severely cost-burdened, or spending more than 50% of income on housing. The situation is even worse with regard to renters, half of whom are cost-burdened and a quarter are severely cost-burdened. Earlier in 2022, the national market-rate rent—$1,797 per month—was up 9% compared to a year ago, in part because supply remains low.[78] Furthermore, at least 568,000 people experienced homelessness in 2019,[79] and this estimate could be up to 2.5 to 10.2 times higher based on common errors in undercounting the homeless population.[80]

In NYC, the COVID-19 pandemic pushed home prices to record highs in 2021. Attempts by the Fed to curb inflation by increasing interest rates made the real estate market even less accessible. In August 2022, rent growth outpaced wage growth by 23% after adjusting for inflation.[81] Real wages in NYC were down 9.1% year-over-year, while rents were up 13.4%. By December 2022, NYC was listed as the most expensive city in the world to live in.[82] Estimates from 2021 suggest that more than half of all renters in NYC are cost-burdened—much higher than nationwide estimates.[83] The rental market is especially inaccessible to younger, lower-income residents. Between 2017 and 2021, the housing stock shifted toward larger units resulting in a net loss of about 55,000 studio apartments

[76] Benner and Pastor, *Solidarity Economics*, 112.
[77] Harvard Joint Center for Housing Studies, "The State of the Nation's Housing 2020," Joint Center for Housing Studies of Harvard University, 2020, https://www.jchs.harvard.edu/sites/default/files/reports/files/Harvard_JCHS_The_State_of_the_Nations_Housing_2020_Report_Revised_120720.pdf.
[78] Stefanos Chen, "The Housing Market Is Worse Than You Think," NYTimes, 4 November 2022, https://www.nytimes.com/2022/11/04/realestate/housing-market-interest-rates.html.
[79] U.S. Department of Housing and Urban Development, "The 2019 Annual Homelessness Assessment Report (AHAR) to Congress," HUD Exchange, January 2020, https://files.hudexchange.info/resources/documents/2019-AHAR-Part-1.pdf.
[80] National Law Center on Homelessness & Poverty, "Don't Count On It: How the HUD Point-in-Time Count Underestimates the Homelessness Crisis in America," NLCHP, 2017, https://homelesslaw.org/wp-content/uploads/2018/10/HUD-PIT-report2017.pdf; Stephen Metraux et al., "Assessing Homeless Population Size through the Use of Emergency and Transitional Shelter Services in 1998: Results from the Analysis of Administrative Data from Nine US Jurisdictions," *Public Health Reports* 116, no. 4 (July 1, 2001): 344-352.
[81] Kenny Lee, "Gap Between NYC Wage Growth and Rent Growth Widens," StreetEasy, 6 October 2022, https://streeteasy.com/blog/nyc-wage-rent-gap-widest-since-2008/.
[82] "New York and Singapore rank as the world's most expensive cities," Economist Intelligence Unit, https://www.eiu.com/n/new-york-and-singapore-rank-as-the-worlds-most-expensive-cities/.
[83] NYC Department of Housing Preservation and Development, "2021 New York City Housing and Vacancy Survey Selected Initial Findings," 16 May 2022, https://www1.nyc.gov/assets/hpd/downloads/pdfs/services/2021-nychvs-selected-initial-findings.pdf.

and a net increase of all other sizes (one-, two-, and three or more bedroom units).[84] Less than half (48.2%) of NYC's four-million-person workforce earned enough in wages to afford just a fraction (10%) of the rental inventory available in summer 2022, unless they spent more than half of their income on rent—which would have made them severely cost-burdened.[85] Many of these people provide essential services such as healthcare, food preparation, and transportation.

The situation is similarly bleak in other global cities. In San Francisco, the Bay Area added only one home for every seven new jobs created between 2010 and 2015, while rents increased more than 40% during the same period.[86] In London, UK, housing prices quadrupled in the two decades leading up to 2017.[87] High rents are pushing more people into poverty, increasing wealth disparities, and causing many people to seek cheaper options in the suburbs—creating a spatial inequality effect between London and the rest of the country. In Amsterdam, Netherlands, deregulatory interventions and a focus on private home ownership have caused the share of non-market housing to decrease from 58% to 44% between 1995 and 2015, challenging the role of the social renter sector in sustaining social equality in the city.[88] In 1995, average private sector rents in 1995 were comparable to social sector ones: € 277 versus € 240, respectively.[89] Since then, private rents have rapidly increased to almost double that of the social sector in 2015.

In Seoul, South Korea, the Oscar-winning "Parasite" put international attention on the awful living conditions of semi-basement apartments, or banjiha. According to the 2020 census, there were about 200,000 banjiha (5% of all households) in Seoul, and 330,000 nationwide. Authorities finally moved to phase out these units after three people died in floods in August 2022, but plans for affordable alternatives are uncertain.[90] In Hong Kong, public housing has long been a primary mechanism for addressing inequality. As of the second quarter of 2022, Hong Kong houses about 2.16 million people (~30% of the population) in about 850,700 public housing units.[91] However, the problems are that most units are too small and the waiting list to move in can be several years long. Further, the development of new market housing has historically been limited, causing private sector rents to be among the highest in the world. While the policy landscape has changed with Beijing's political overhaul of the city, many underprivileged residents still live in tiny subdivided units or 'cage homes', and prices aren't expected to fall any time soon.[92]

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[84] NYC DHPD, "2021 NYC Housing and Vacancy Survey Selected Initial Findings."
[85] Lee, "Gap Between NYC Wage Growth and Rent Growth Widens."
[86] Jenny Shuetz, "Dysfunctional policies have broken America's housing supply chain," Brookings Institute, 22 February 2022, https://www.brookings.edu/blog/the-avenue/2022/02/22/dysfunctional-policies-have-broken-americas-housing-supply-chain/.
[87]Tony Travers, Sam Sims, and Nicolas Bosetti, "Housing and Inequality in London," Centre for London, June 2017, https://www.centreforlondon.org/wp-content/uploads/2016/08/CFLJ4292-London-Inequality-04_16_WEB_V4.pdf.
[88] Robbin Jan Van Duijne and Richard Ronald, "The unraveling of Amsterdam's unitary rental system," *Journal of Housing and the Built Environment* 33 (2018): 633-651. https://doi.org/10.1007/s10901-018-9601-x.
[89] Van Duijne and Ronald, "The unraveling of Amsterdam's unitary rental system."
[90] Melissa Zhu, "Seoul floods: 'Parasite-style' flats to be banned after deaths," BBC News, 11 August 2022, https://www.bbc.com/news/world-asia-62501192.
[91] Hong Kong Housing Bureau, "Hong Kong: The Facts – Housing," Gov HK, July 2022, https://www.gov.hk/en/about/abouthk/factsheets/docs/housing.pdf.
[92] Shawna Kwan, "New Hong Kong leader's vow to fix housing crisis draws skeptics," Japan Times, 23 May 2022, https://www.japantimes.co.jp/news/2022/05/23/asia-pacific/hong-kong-housing-john-lee/.

In São Paulo, Brazil, prices in central areas are surging drastically due to the speculative real estate market. Many low-income families have historically had no other option than to live in favelas—self-built housing erected on untitled land—and cortiços—buildings packed with extortive, subletting units which house several families and lack legal protections.[93] All of this takes place in a city of 30,000 millionaires (approximately one for every 100 of the city's poor), and one of the highest income disparities in the world.[94] In Lagos, Nigeria—the most populous state in Nigeria and in Africa, with an estimated population of 21 million people—a reality of extreme housing inequality and an insufficient public budget for tackling social issues dampen aspirations as the city of the future.[95] Nearly two thirds of the metro population occupies informal settlements, squatter housing, unauthorized land developments, or dilapidated units.[96] A practice of paying a full year's worth of rent upfront makes getting into adequate formal housing even less accessible.[97]

Housing markets determine not only where someone lives, but also their job, lifestyle, friends, and future. Unaffordable housing hurts individuals, families, and the overall economy. Since people spend so much of their income on housing, the reduced consumption of goods and services results in lost output. The McKinsey Institute calculated that this costs California alone more than $140 billion in lost economic output each year.[98] Housing prices also constrain the ability of growing firms to hire employees, reducing economic output by as much as 8.9% according to some estimates.[99] More broadly, restrictive land use regulations and the subsequent spatial misallocation of labor are estimated to have lowered aggregate US growth by about 36% between 1964 and 2009.[100]

Lack of affordable housing and the segregation of housing markets are major contributors to economic inequality, and they are often amplified along intersectional divides. Housing abundance is a critical part of creating a healthier economy. This chapter details three steps to growing the supply of housing and lowering costs. The first step is to reduce the cost of land. Second, enable dense, mixed use urban planning. Third, provide funding for various forms of non-market and social housing. The overall economy can still grow massively without exploiting the need for shelter.

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[93] United Nations Human Settlements Programme (UN-HABITAT), "São Paulo: A Tale of Two Cities," UN-HABITAT, 2010, https://unhabitat.org/sites/default/files/download-manager-files/Sao%20Paulo%20A%20tale%20of%20two%20cities.pdf; Christoph Schmocker, "Making Gentrification Sustainable: Renato Cymbalista on how affordable social housing is essential to bridging the wealth gap," Wealth Inequality Initiative, 2021, https://www.wealth-inequality.net/stories/making-gentrification-sustainable.

[94] UN-HABITAT, "São Paulo."

[95] Fola, Adeleke, "Tackling Housing Inequality In Lagos Nigeria, By Fola Adeleke," Premium Times, 8 March 2019, https://opinion.premiumtimesng.com/2019/03/08/tackling-housing-inequality-in-lagos-nigeria-by-fola-adeleke/.

[96] Olaoluwa Pheabian Akinwale, "Urban Slums in Nigeria: Ensuring Healthy Living Conditions," Urbanet, 25 October 2018, https://www.urbanet.info/nigeria-lagos-slums-urban-health/.

[97] Immaculata Abba, "What will it take for monthly rent payment to work in Nigeria?" African Arguments, 27 July 2022, https://africanarguments.org/2022/07/what-will-it-take-for-monthly-rent-payment-to-work-in-nigeria/.

[98] Jonathan Woetzel et al., "A Tool Kit to Close California's Housing Gap: 3.5 Million Homes by 2025," McKinsey Global Institute, October 24, 2016, https://www.mckinsey.com/featured-insights/urbanization/closing-californias-housing-gap#.

[99] Chang-Tai Hsieh and Enrico Moretti, "Housing Constraints and Spatial Misallocation," *American Economic Journal: Macroeconomics* 11, no. 2 (2019): 1-39, https://pubs.aeaweb.org/doi/pdfplus/10.1257/mac.20170388.

[100] Hsieh and Moretti, "Housing Constraints and Spatial Misallocation."

## 4.1 Land Value Recycling (#5)

**Land is expensive and makes landowners a lot of money in existing cities. It drives up rents and development costs for the rest of us. Its consistent value appreciation also incentivizes landowners to not build—constricting housing supply and further increasing rents. Neutralizing rentier profits from land ownership through Land Value Recycling promotes economic growth and housing development, lowers rents, distributes profits fairly to laborers and capital owners, and supplies a major source of funding for the physical city.**

The most expensive part of developing in cities is often not construction costs. Similarly, the reason why your rent is so high is probably not to compensate for your landlord's gracious service. The reason for both, according to Georgism, is usually because land is ridiculously expensive.[101]

As obvious as it is, land is necessary to our existence and the production of goods and services. It is where we live, work, and procure the natural materials for our work. We build real estate and housing on land. Since land is so important, landowners are able to charge high prices for its rent and sale. Furthermore, the value of land is always rising because we can't make more of it. That means higher profits to landowners over time, compared to slower growth in wages (labor) and interest (capital owners).

Unfortunately, not all landowners are productive and maintain their land. Since rent is lucrative, speculators buy land to resell it later for profit. It is more profitable to buy new land than to develop what they already own. So, this land often goes underdeveloped, constraining housing supply and further raising rents. As other people are forced to use less valuable land, the margin of production decreases and the speculators' land values increase. This is how underdeveloped plots can exist in urban areas with extremely high land values, and a big part of why rent is so expensive in most global cities. In the words of Jane Jacobs, "the two greatest money makers in cities are, on the one hand, unsuccessful, perpetual slums and, on the other hand, high-rent or high-cost areas."[102]

These easy profits from land come at the expense of laborers and capital owners. Even close inspection of concentrated capital resources uncovers that many of these are actually held in real estate and housing.[103] Where land ownership is monopolized, wages become minimized, laborers are unable to save any profits, and the distribution of capital becomes concentrated among the few. Land rents are a primary contributor to economic inequality because all rents are excessive. They do little to spur innovation and productivity, instead rewarding passive ownership.

[101] This practice is inspired by the ideas of Henry George and Georgist economics. See Henry George, *Progress and Poverty*. For a great summary, see https://astralcodexten.substack.com/p/your-book-review-progress-and-poverty.
[102] Jacobs, *The Death and Life of Great American Cities*, 288.
[103] Matthew Rognlie, "Deciphering the Fall and Rise in the Net Capital Share: Accumulation or Scarcity?" *Brookings Papers on Economic Activity* (Spring 2015), https://www.brookings.edu/wp-content/uploads/2016/07/2015a_rognlie.pdf.

**Land Value Recycling** (LVR) can help fix these problems. LVR is the collection of excess profits from land ownership. Whereas a traditional property tax is a partial tax on land and the improvements (e.g., houses and other capital) built atop it, LVR applies to the total value of the land but *not* the improvements. LVR incentivizes development and mitigates speculation on empty land because only landowners with the intent to productively use land will own it. Productive landowners benefit from not having to pay taxes on what they build, while unproductive landowners lose money. LVR also returns (via lower rents and greater consumption) the unfair profits of unproductive landowners back to the laborers who produce goods and services and the capital owners who finance that production.

LVR in Spectra will start with the establishment of a city area. The Spectra cooperative will coordinate with a host country to purchase land. Cluster cooperatives will then be able to bid on parcels to begin construction. Cluster cooperatives will purchase land using Spectra-wide tokens and receive newly minted city tokens in return (See 3.2). These tokens will accrue value over time as the city grows. At the time of purchase, Spectra will implement an LVR rate on these plots of land. Over time, the funds from land auctions and LVR will pay off the purchase amount negotiated between Spectra and the host country. Since Spectra will be a new city, the LVR rate must be lower in its initial years to not create artificially high barriers to entry nor burden clusters trying to develop their land.

Not all of the land may be available to clusters at the beginning. Instead, about 25% of the total land area may be available in the first land auction and the LVR would be set at a lower rate. Then, in the second auction, another 25% of the total land area would be available to purchase. The LVR rate of the first plots would then be increased, while the rate for the new plots would again be set lower. We would repeat this process for any subsequent auctions until all the parcels have been purchased. Over time, the LVR will be incrementally raised to reflect 85% of land value collected at a 5% annual rate.[104] This amount may vary by location, as some plots will be more valuable. Eventually, land value could be reassessed every 5-10 years to keep accurate LVR practices.

Since no cluster cooperatives are sitting on empty land, developments increase the supply of housing and other real estate. This makes rent more affordable and no longer prices out public and short-term housing options (See 4.3). LVR helps to achieve dense, walkable cities by eliminating speculation and incentivizing development. LVR also creates large funding streams for social programs that are centrally collected but locally allocated to blocks and clusters through the Community Fund (See 5.3).

For Spectra, LVR should not be thought of as a tax. Rather, it is a practice for cutting out deadweight from the economy, promoting economic growth and housing development, reducing

[104] In more practical models, the rate is set at 85% of land value collected at roughly a 5% annual rate, because an 85% rate provides a buffer for potential over-assessment of land value while still capturing the majority of land value over time even in the case of under-assessment. See https://astralcodexten.substack.com/p/does-georgism-work-part-3-can-unimproved.

artificially high real estate prices, returning fair profits to workers and capital owners, and funding public infrastructure and social programs. Whereas LVR is difficult to implement in existing cities because of deep-rooted political and economic incentives, building a new city with LVR implemented from the beginning can create new possibilities for sustainability, livability, and affordability.

## 4.2 Dense, mixed use, and modular planning (#6)

**Cities produce agglomeration effects for innovation and economies of scale for industry. These benefits increase when cities are densely populated and have mixed use development. Removing zoning restrictions allows us to build new cities which better reflect the diverse needs and interests of residents. Modular block designs speed up construction timelines and accommodate incremental population growth. Both zoning reform and modularity unlock the ability to develop more housing supply.**

The second step to providing housing abundance is to create a policy environment and city layout which facilitates building more housing as the city's population increases.

Compounding the problem of high land values, landowners often lobby against new developments which might affect their property values but would otherwise result in significant collective economic gains for the rest of society. They prevent the market from correcting itself to add housing stock where it is needed. A new apartment building which could house hundreds of people—decreasing the local cost of living and subsequently improving quality of life—is vetoed by a handful of nearby landowners. In these cases, the land stays underdeveloped, local prices stay high, and the apartment building must go somewhere else—that is, if it's built at all.[105]

In most places, land use and housing regulations make it difficult to build more housing stock to buy or rent. In the US, every state across the country requires explicit approval from the local government to build new homes or alter or tear down existing ones. Local property owners possess several legal and political tools—zoning laws, historic preservation, environmental regulations, and direct lobbying of elected officials—to block attempts to change the status quo, no matter how bad it is for the majority of people seeking affordable options.[106]

Unproductive land ownership—whether it's caused by speculative holding, bad zoning laws, or NIMBYs—isn't bad just for non-landowners. It makes cities worse for everyone. Wasted land and single-use zoning result in less livable, less enjoyable cities surrounded by suburban sprawl. These conditions are unwalkable and the area is often not densely populated enough to financially support robust public transportation systems. As a result, cars, traffic lanes, and parking lots dominate cityscapes and break up what could have been bustling mixed-use neighborhoods into single-use

[105] This paragraph refers to the NIMBY-YIMBY divide in many countries.
[106] Jenny Schuetz, Fixer-Upper: How to Repair America's Broken Housing Systems (Brookings Institution Press, 2022).

retail islands far away from their customers' homes. This has had a profound effect in the United States where suburban sprawl, private home ownership, private transportation, and gender roles in employment have historically excluded women from urban spaces.[107]

Where cities have historically lacked clear long-run development plans, particularly in developing countries, informal settlements and slums develop along the periphery—recall São Paulo and Lagos (See 4). These areas usually lack legal protection and reliable public services, such as utilities, sanitation, and healthcare infrastructure. Since their pattern of growth is one of organic disarray, integrating these areas into regional connective infrastructure and improving living conditions typically requires tearing down much of what their residents built by hand over decades. Since these settlements were built outside of the law and any deeds are often unrecognized by government officials, residents are evicted without compensation.

Dense, mixed use, and modular planning can revitalize existing cities, fortify growing cities, and unlock new cities which are sustainable, livable, and affordable. When cities accommodate density from the beginning and quickly add new blocks as needed, they can avoid the overcrowding and public service inefficiencies which accompany unchecked population growth. Zoning practices which focus on limiting what *cannot* be built (e.g., a chemical plant next to an apartment building) instead of what *can* be built (e.g., a housing extension in a commercial area) reorient regulation toward protecting public health and safety. For example, flexible land use policies in Japan have allowed Tokyo—the most populous metro area in the world—to develop countless urban treatments and robust public transit systems, whereas euclidean zoning has stripped many US cities down to single-use lots, car parking, and suburban sprawl.[108]

Dense, mixed use cities are more walkable and economically productive too. Projections for Columbus, Ohio, indicate that this style of planning could decrease the region's total driving by 30%, reduce greenhouse gas emissions by 33%, save the city $80 million per year, and significantly improve public health.[109] Dense cities produce agglomeration effects for innovation and economies of scale for industry.[110]

For Spectra, the dense, mixed use, and modular development of its physical city will enable it to be sustainable, livable, and affordable. The absence of restrictive zoning regulations will allow new housing supply to be built as it is needed, so that artificial scarcity does not reduce quality of life. Modular urban planning will allow new city blocks to be built quickly and integrated into existing

[107] Leslie Kern, *Feminist City* (London: Verso, 2021), 29-54.
[108] Urban Kchoze, "Japanese Zoning", 6 April 2014, accessed 3 February 2023, https://urbankchoze.blogspot.com/2014/04/japanese-zoning.html; Nolan Gray, "Why Is Japanese Zoning More Liberal Than US Zoning?" Market Urbanism, 19 March 2019, accessed 3 February 2023, https://marketurbanism.com/2019/03/19/why-is-japanese-zoning-more-liberal-than-us-zoning/.
[109] Ben Green, *The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future* (2020), 32.
[110] Chuanglin Fang and Danlin Yu, "Urban agglomeration: An evolving concept of an emerging phenomenon," *Landscape and Urban Planning* 162 (2017): 126-136; Sam Bowman and Stian Westlake, "Reviving Economic Thinking on the Right: A short plan for the UK," https://revivingeconomicthinking.com/full-report/.

infrastructure without massive overhauls. Housing abundance will create a business environment where people from the host country and abroad can migrate to find jobs and contribute to innovation in healthy growth sectors.

## 4.3 Non-market housing (#7)

**Non-market housing, such as housing cooperatives, can offer lower prices because they don't seek to maximize profits for a private landlord. The cooperative members are the owners. Rent is collected to cover necessary costs, such as maintaining the building and paying off any loans for its construction. Over time, especially once any loans are paid off, rents can remain low while the rest of the market inflates. Accessible housing markets are good for society and the economy.**

The third step to providing housing abundance is to fund and build non-market housing options. Spectra's approach reflects concern for all households, including providing security to long- and short-term renters, promoting social housing, and ending homelessness. That's why Spectra aims to have non-market housing, including various forms of social housing, be seen as normal and not stigmatized. For example, in Vienna, 60% of the population lives in non-market housing, regardless of income. Private landlords there must reduce their prices to compete with the lower prices of non-market options. Affordable housing not only helps the poor, but also contributes to increased savings rates, helps stretch family income, and contributes to a vibrant and stable economy.

Non-market housing developments often start out with prices similar to the market rate (if they do not receive any subsidies, which would lower the cost on renters). However, whereas market prices will continue to rise over time, non-market housing prices stay lower because they are run without the goal of maximizing rent profits. Being located in up-and-coming areas of Spectra's city would enable residents to accrue value by owning a portion of the property in tokens (See 3.2), and see their rents become more affordable as Spectra grows. Tokens offer an alternative to private real estate as a financial asset for long-term investment. Once any initial construction loans are paid off, rent can become even cheaper since there are less necessary expenses (e.g., building maintenance) to cover. Non-market housing offers a stable price now, and an affordable price in the long run.

Two great new and old examples of non-market housing in Vancouver, Canada, are Athletes Village Co-op in Olympic Village and View Court Housing Co-op.[111] Though, these two developments can't provide lower prices to everyone. They are popular and have very long waitlists because they are cheap. In fact, only 5% of all households in Canada live in non-market housing.[112] The solution,

[111] "Athletes Village Housing Co-op," https://avillagecoop.wordpress.com/; View Court Housing Co-op, https://viewcourt.vcn.bc.ca/.

[112] J. David Hulchanski, "Canada's Dual Housing Policy: Assisting Owners, Neglecting Renters," University of Toronto Centre for Urban and Community Studies, September 2007, http://www.urbancentre.utoronto.ca/pdfs/researchbulletins/CUCSRB38Hulchanski.pdf.

then, (in addition to reducing land costs and enabling dense urban planning) is to focus more funds toward building non-market housing until it makes up a larger portion of the total housing supply. If you build enough, it stabilizes lower rent prices. To do so, Spectra's plan combines aspects of limited equity housing cooperatives, publicly subsidized housing, and community land trusts.

In limited equity housing cooperatives, people do not individually own the housing, but are essentially buying shares in a cooperatively owned building, while paying regular rent. In the US, they started in NYC in the 1920s and as many as 425,000 units may have existed across the US at the peak, though the number is closer to 160,000 today, as many units have subsequently converted to market-rate co-ops.[113] In Spectra, cooperatives could organize to have residents rent apartments and own the improvements while earning ownership in their block through regularly paying rent and receiving tokens in return.

In publicly subsidized housing, the state offers financial incentives to develop and/or maintain housing supply. In Singapore, 82% of residents live in publicly subsidized housing insulated from market pressures, and housing affordability is seen as an important contributor to high levels of entrepreneurialism and rapid economic growth.[114] Most of these complexes come with easy access to parks with exercise areas, meeting spaces, and affordable food options at bustling outdoor ground-level food courts.[115] For Spectra, a guaranteed-rent method of publicly subsidized housing would focus on the construction of buildings instead of subsidizing individual units. These could be sections of residential buildings, entire buildings, or even entire blocks.

To encourage members of blocks/clusters to develop a portion of their buildings as non-market or public housing, Spectra could guarantee the loan (or mortgage) financing the construction and guarantee a subsidized rent rate for the dwellings which is sufficient to carry them economically, as well as other possible incentives.[116] In contrast to traditional public housing in the US, the advantage of keeping the capital costs of building in the rent equation as a loan is that the capital subsidy becomes much more flexible in its application to tenants. It no longer needs to be used to sort out people by income because everyone is paying the same guaranteed rate. Spectra would then pay the difference for tenants who cannot pay the full rent amount through Community Fund allocations (See 5.3), and these tenants would only earn block tokens for the portion of the rent that they paid.

The tenants' incomes would be re-examined annually and the difference adjusted. If a tenant's income improved, their portion of the rent payment would go up and the amount paid by Spectra would go down. When a tenant becomes able to pay the full rent, they start earning block tokens at the same rate as other full-paying members. Hence, this is an incentive to work hard and pay one's

[113] Benner and Pastor, *Solidarity Economics*, 116-117.
[114] Benner and Pastor, *Solidarity Economics*, 116-117.
[115] Klinenberg, *Palaces for the People*, 135.
[116] Of course, this would involve an evaluation of which blocks and clusters are reliable investments to be granted loans and are unlikely to default.

fair share, as a larger stake in the block translates to greater long-term profits if it becomes a prosperous community.

Since tenants can afford to stay and eventually transition to paying full rent, the guaranteed-rent method also encourages the formation of more stable communities with less turnover in membership. This stability is the key to collective capacity at the block and cluster levels, as residents of all socioeconomic backgrounds have similar incentives to stay, grow together, and accrue long-term value. This capacity growth is less achievable in traditional public housing projects where people want to move on to a better-off neighborhood as soon as they are financially able.

In community land trusts, a nonprofit acquires land and agrees to maintain ownership. Housing units on the land can be sold, with owners entering into a long-term renewable lease. This keeps the land itself permanently out of the market and lowers the overall cost of housing. In Spectra, some cluster cooperatives could enter into a long-term renewable lease with a nonprofit land trust affiliated with the city cooperative and still be able to develop the land and exercise the rights which normally come with ownership.

Once non-market housing is seen as normal, it can be an option for anyone, including those who are already able to pay the full rent; the needy and those who have fallen on hard times; the elderly; the young; the disabled; the temporarily unhoused; the indigenous/native; the foreign/immigrant; the refugee, persecuted, and asylum-seeking; the newcomers hoping to start a new life; and the wanderers staying for the short-term. Non-market housing has a long history of supporting low-income women, in particular, and creating social networks which go beyond the traditional nuclear family, creating more resilient safe communities.[117] Housing abundance will make Spectra a sustainable, livable, and affordable city for anyone to contribute to shaping the future.

[117] Kern, *Feminist City*, 83.

# 5 Tying it All Together

The remaining three practices build on those which have already been introduced and address some of the core aspects of democratic capitalism which we seek to revitalize: ownership, investment, and debt. We clarify any remaining features of balancing individualism and cooperativism. Crucially, we address how reforms in modern investment and debt practices can unlock healthy growth, enable abundant housing, and spread the risks and rewards of innovation cooperatively and locally.

## 5.1 Private and common ownership (#8)

**Property and ownership rights protect important privileges of cooperatives and their members. Cluster cooperatives can hold authority on their land even though the value of that land is a common asset of the city cooperative. Individuals can participate in economic decision-making. Asset values accrue as Spectra grows, and this value is shared across members according to their stake.**

As a result of Spectra's cooperativism and LVR, value creation is more tied to the project and overall city's growth than just individually-owned properties. Profits from developing the city and contributing to the economy are more fairly rewarded to those actually putting in the work.

- A cluster cooperative owns the land it purchases.[118] This land is common property among its members.
- The value of the land is common property of the city cooperative members. This value is partially collected each year through LVR.
- A block cooperative owns the improvements it makes. These improvements are common property among its members.
- A cluster cooperative owns the improvements it makes which are not attributable to its blocks or the city. These improvements are common property among its members.
- Spectra members own the improvements they make individually to their property; for example, within market-rate apartments.
- Spectra members also own tokens which represent their share of the project. These tokens offer an alternative to private real estate as a primary asset for long-term investment.

Why does preserving the ownership of land matter in a cooperative economy where LVR makes the value of land common property? One reason is that clusters may vary drastically in their composition. For example, if not enough residents of a cluster want to be the suppliers of capital

[118] This could vary for cluster cooperatives which operate as community land trusts in partnership with a nonprofit organization of the city cooperative.

and labor within their cluster, they can open those opportunities to residents from other clusters. Those other residents would be able to open businesses there without having to pay high rents to the host cluster thanks to LVR. In other words, the financial barriers to small businesses are lower. Land ownership also preserves a host cluster's right to deny or expel labor and capital which it does not want. For example, a problematic business could be voted against.

Ownership also grants the right to sell land—should a cluster choose to do so—and earn any profits for the improvements built atop it. This contrasts with most renting situations today, where renters do not receive any benefits from maintaining or improving their rental properties. This issue is at the heart of many contemporary gentrification controversies, where the initial residents of a neighborhood might build up the local cultural landscape and economy only to be evicted later on for new tenants who can afford a higher rent. A similar process occurs when governments forcibly buy up properties through eminent domain to construct new highways through urban areas. Yes, the eviction is problematic, and the lack of fair compensation is doubly so.

There are also broader reasons to retain private ownership. As previously stated, Spectra is not an attempt to eradicate all differences in people's income and wealth, but rather focused on reducing the worst forms of inequality in cities which ravage society, damage growth, and poison the environment. From a basic democratic viewpoint, a fundamental flaw in many previous attempts to create alternative models of ownership was the failure to recognize the rights of residents, workers, and voters to participate meaningfully in economic decision-making.[119] For example, replacing private ownership with state ownership merely exchanged the property rights of capitalists with those of state elites. In contrast to such monolithic approaches, it is important to recognize both private and common ownership.

So, in Spectra, not everyone will have equal ownership of land or property. For instance, block cooperative members may hold different stakes in common property via tokens (See 3.2) and put varying levels of effort into improving their private property. However, all Spectrans will have *a* stake which ensures their due returns from contributing to the community's development.

## 5.2 Investment and debt reform (#9)

**An ever-increasing share of financial capital is held by a diminishing number of large entities. Banks finance this by creating more money through credit. The bulk of bank-generated credit is used to purchase existing assets to boost short-term gains in stock prices, rather than to make productive long-term investments in the real economy, such as capital equipment, R&D, and worker training. Reforming investment and debt practices would liberate healthy growth opportunities and create massive profits in the long-term.**

[119] Cumbers, *Economic Democracy*, 55.

*"A gambit is a chess opening in which a minor piece, often a pawn, is sacrificed to gain an advantage. It is therefore a matter of voluntary risk taken strategically in order to gain a significant advantage that is higher than and compensates for the original loss."*[120]

So, the world population is growing, and the cities and economic growth to support it need to become much healthier. Encouraging firms to embrace innovations in social and resource productivity can solve these issues and be massively profitable in the long run. Many such business models already exist and can be adapted across sectors to fit the skillsets of other firms. This type of innovation could even be the key to economic development in many Global South countries. What's stopping us from going all in?

Partially, a new culture of short-term profitable, but unproductive, financialization. In the second half of the 20th century, rules governing the financial industry and innovation were relaxed, making the financial system an increasingly attractive place to accumulate capital. More capital has been generated by investing in debt and less by investing in labor, industry, and other sectors of the real economy.[121] Financialization denotes the shift in focus of profit generation from the real to the financial economy, as finance firms achieve higher returns on invested capital than industrial companies or non-financial service providers.[122]

Corporate profits are used to boost short-term gains in stocks instead of long-term investment in capital equipment, R&D, and worker training.[123] A corporation can artificially boost its stock prices by purchasing its own shares; this benefits executives who are paid in these stocks. In the decade preceding 2019, total buybacks by the Fortune 500 exceeded almost $4 trillion, with many companies spending over 100% of their net income on buybacks and dividend pay-outs.[124] In the 2000s, a 470% leap in interest and dividend receipts helped Nike to increase its income by $1.2 billion despite spending 12% less on raw materials for sportswear production.[125] GE Capital, the financial arm of the holding company of electronics giant GE, is responsible for more than half of its profits, and is now the 7th largest bank in the US.[126] In 2004, General Motors generated only 34% of profits from its automotive division; instead, 66% came through its in-house bank. In that same year, Ford achieved net profits of billions, despite posting losses in its automotive division.[127]

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[120] This quote was originally used in the context of the digital revolution. Floridi, *The Fourth Revolution*, 214.
[121] Sahr, *Keystroke Capitalism*, 7.
[122] Greta Krippner, "The Financialization of the American Economy," *Socio-Economic Review* 3, no. 2 (2005): 173-208; Greta Kippner, *Capitalizing on Crisis: The Political Origins of the Rise of Finance*, Cambridge, MA, 2011, 31-33.
[123] W. Lazonick, "From Innovation to Financialization: How Shareholder Value Ideology Is Destroying the US Economy," in M. Wolfson and G. Epstein, eds., *The Handbook of the Political Economy of Financial Crises* (Oxford: Oxford University Press, 2013).
[124] Mazzucato, *Mission Economy*, 17.
[125] Matthew Soener, "Why Do Firms Financialize? Meso-Level Evidence from US Apparel and Footwear Industry, 1991-2007," Socio-Economic Review 13, no. 3 (2015).
[126] Sahr, *Keystroke Capitalism*, 16; Krippner, *Capitalizing on Crisis*, 29.
[127] Sahr, *Keystroke Capitalism*, 16; Ken-Hou Lin and Donald Tomaskovic-Devey, "Financialization and U.S. Income Inequality, 1970-2008," *American Journal of Sociology* 118, no. 5 (2013): 1293.

A driving force behind financialization has been credit. The bulk of bank-generated credit has been used to purchase existing assets. Unsurprisingly, a growing share of financial capital is held by a diminishing number of conglomerates consisting of more and more individual firms. For example, the top 50 US financial conglomerates comprise an average of 76 different companies spread across several countries and legal territories.[128] This networking effect makes it possible to conduct insider loans, circular credit, and debt loops. Turner estimates that since the 1990s (at least until the 2008 crisis), only 15% of new loan capital has been created for productive investments.[129] Mazzucato arrives at a similar estimate of only 20% of finance going to the productive economy, such as companies that want to innovate or infrastructure that needs building.[130]

Instead, financial lending goes back into a recurring topic of this paper: land. In 1970, real estate lending constituted about 35% of all bank lending in advanced economies; by 2007, the figure had risen to about 60%.[131] Mortgages make up the majority of bank credit in advanced economies—not to finance the construction of new houses, but to buy land. Roughly 80% of the rises in house prices in these countries from 1950 to 2012 was attributable to the land under them.[132] The ownership of real estate is less concentrated than that of financial assets, but price rises are still primarily in urban areas, and rarely in areas inhabited by the less well-off.[133]

In Section 4.1, we detailed how land values fuel speculation. When those speculative bubbles burst, as happened in 2008, banks and corporate investors go begging for government bailouts. The same thing happens when unforeseen crises—such as the COVID-19 pandemic—occur. Governments deem some of these institutions as too big to be allowed to fail, and bail them out to prevent the entire financial system from collapsing.[134] In the ten years prior to 2019, six of the biggest airlines in America spent an average of 96% of their free cash flow on stock buybacks.[135] Yet, they still begged for government bailouts at the start of the COVID-19 crisis.

These bailouts get translated into higher overall taxes, which—when combined with reduced top tax rates and corporate taxes, tax havens, and rolled back social security contributions—effectively diminish the capability of the redistributive state and shift the financial burden from the rich who

[128] Mazzucato, *Mission Economy*, 86; Leo Panitch and Sam Gindin, *The Making of Global Capitalism: The Political Economy of American Empire* (London: 2013), 120.
[129] Adair Turner, *Between Debt and the Devil: Money, Credit, and Fixing Global Finance* (Princeton: 2016), 133; Adair Turner, "What Do Banks Do? Why Do Credit Booms and Busts Occur and What Can Public Policy Do About It?, in Adair turner, Andrew Haldane, Paul Woolley, et al., eds., *The Future of Finance: The LSE Report* (London, 2010); Sahr, *Keystroke Capitalism*, 80.
[130] Mazzucato, *Mission Economy*, 15.
[131] Mazzucato, *Mission Economy*, 15; Òscar Jordà, Moritz Schularick, and Alan M. Taylor, "Macrofinancial History and the New Business Cycle Facts," *NBER Macroeconomics Annual* 31, no. 1 (2017): 213-263.
[132] Sahr, *Keystroke Capitalism*, 81; Adair Turner, *Between Debt and the Devil*, 67f.
[133] Matthew Rognlie, "Deciphering the Fall and Rise in the Net Capital Share: Accumulation or Scarcity?" in *Brookings Papers on Economic Activity,* 2015.
[134] Mazzucato, *Mission Economy*, 15.
[135] Mazzucato, *Mission Economy*, 17; Philip van Doorn, "Airlines and Boeing want a bailout — but look how much they've spent on stock buybacks," MarketWatch, https://www.marketwatch.com/story/airlines-and-boeing-want-a-bailout-but-look-how-much-theyve-spent-on-stock-buybacks-2020-03-18.

were profiting from reckless speculation onto the middle and lower classes who were already working toward paying off the mortgages on their own homes.[136] Looking at the eurozone, for example, the richest 10% hold an average debt of 20% of their assets, whereas the lowest-earning 20% owe roughly 110% of their assets, leaving them on average hopelessly over-indebted.[137] Everyday people are not as easily afforded the same bailouts. Consider the massive battles in legislatures and courts required to pass COVID-19 relief for individuals, families, and small businesses. Or the ongoing student debt crisis in the United States. This situation is about as far from socially productive growth as possible.

The obsession with maximizing shareholder value is based on a backwards logic which makes the rest of the population worse off. Even Jack Welch, the late CEO of GE, later in life called shareholder value 'the dumbest idea in the world.' He explained, 'Shareholder value is a result, not a strategy… Your main constituencies are your employees, customers, and products… Short-term profits should be allied with an increase in the long-term value of a company."[138] The financial aspiration of Spectra is that token values go up because the city is prospering in real terms, not just because of hype and speculation (See 3.2).

Building a productive, resilient economy which can grow in bull markets and preserve in bear markets requires investing into real assets for long-term profits and growth. Surely, airline companies could have invested into renewable energy technology and other green firms which would have softened the blow on their revenue streams from unforeseen travel lockdowns. Sacrificing some short-term profits to invest more purposefully into long-term, stable healthy growth is Spectra's gambit. Like the Apollo missions which got mankind to the moon, even if it's costly up front, the multiplying effects of multi-sectoral innovation end up producing more profits throughout the economy in the long run.[139]

## 5.3 Community Fund (#10)

**Finance should be long-term, work for society, and be replenished rather than extracted. Because innovation is inherently uncertain and investment comes with no guaranteed returns, the value that is collectively created should be fairly distributed across all**

[136] Sahr, *Keystroke Capitalism*, 94, 100-101; Ronen Palan and Anastasia Nesvetailova, "Elsewhere, Ideally Nowhere: Shadow Banking and Offshore Finance," *CITYPERC Working Paper Series* 1, 2014: 26; Wolfgang Streeck, *Buying Time*, trans. Patrick Camiller and David Fernbach, (London: 2017); Graham Hodgson, "Banking, Finance and Income Inequality", Positive Money, October 2013; Andrew Jackson and Ben Dyson, *Modernising Money: Why Our Monetary System is Broken and How It Can Be Fixed* (London: 2014) , 156.
[137] Sahr, *Keystroke Capitalism*, 6; Credit Suisse, *Global Wealth Databook 2016*.
[138] Steve Denning, "Making Sense Of Shareholder Value: 'The World's Dumbest Idea'", Forbes, https://www.forbes.com/sites/stevedenning/2017/07/17/making-sense-of-shareholder-value-the-worlds-dumbest-idea/?sh=1c8903da2a7e#15ba6a722e.
[139] Mazzucato, *Mission Economy*.

**contributors. The Community Fund catalyzes healthy local growth for people, planet, and profits through (p)redistributive funding across Spectra's multilayer cooperative structure.**

The **Community Fund** is a pool of tokens which allocates common funding by depositing into cooperatives' wallets across Spectra's multilayer structure for development projects and social programs. The token supply of the Community Fund will not be set to oscillate within a predefined range. Rather, the Community Fund will start at about 30-40% of the total Spectra-wide token supply. It grows as capital enters Spectra through financial activity, such as a percentage of any membership fees, physical land purchases, LVR, in-game transactions, and the sale of digital goods.

At the city layer, the Community Fund accounts for physical infrastructure, social programs, and other basic needs which should be addressed systematically. The Community Fund also resolves common costs in the virtual world, such as server hosting. Remaining funds, particularly at the block and cluster layers, can be spent according to participatory budgeting. A portion of the Community Fund will also be allocated to cooperatives as grants or loans on an ad hoc basis via an application process. If approved, the funds would be added to the cooperative(s)'s wallet(s).

Reducing economic inequality boosts economic growth and is good for society (See 1.1). The goal is that the Community Fund acts as a set of predistributive and redistributive tools designed by and for the Spectra community to create and maintain sustainable, livable, and affordable cities. Predistributive tools—such as social housing, public education, and common investment in R&D for multi-sectoral healthy growth—can reduce inequalities before they arise. Meanwhile, redistributive tools—such as LVR, carbon taxes, social safety nets, and workfare programs—can aid in rectifying any excessive inequalities which persist. While it is important to use common funds to fix problems (redistribution), we can also use them to create solutions so our economy is more resilient, fair, and sustainable in the first place (predistribution).

An important component of predistribution in a project as ambitious and innovative as Spectra is the cooperativization of investment. Keynes was interested in mutual companies and cooperatives because they share risks *and* rewards—reinvesting profits back into the company for long-term growth and distributing income between the collective sets of owners.[140] This contrasts with many examples of public investment, in which tax dollars are used to bail out companies in crisis (See 5.2) or invested into R&D for future world-changing inventions, but taxpayers do not directly receive any profits when the good times come around.[141] For example, in 2009, Tesla benefited from a $465 million guaranteed loan from the US Department of Energy without the government retaining any equity stake.[142] When Tesla prices per share increased nearly tenfold afterward, none of that went to

[140] John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (1936); Mazzucato, *Mission Economy*, 192-193.
[141] For more examples of how public investment has shaped private-sector innovation, see Stoknes, *Tomorrow's Economy*, 259-260; Mariana Mazzucato, *The Entrepreneurial State: Debunking Public Sector vs Private Sector Myths* (London: Penguin, 2018).
[142] William Lazonick and Mariana Mazzucato, "The Risk-Reward Nexus in the Innovation-Inequality Relationship: Who Takes the Risks? Who Gets the Rewards?", *Industrial and Corporate Change* 22, no. 4 (2013): 1093-1128; Mariana Mazzucato, "We

cover other public investments which hadn't worked out, to fund the next round of public investments, nor directly into taxpayers' pockets.

The cooperativization of investment means sharing both the risks and rewards—not just the risks—and reinvesting the rewards back into Spectra. Successful investments boost the prosperity of blocks and the project overall, resulting in higher token valuations. Hypothetically, there can be at least five groups of beneficiaries from a Community Fund loan by the Spectra-wide cooperative to a block cooperative: (1) the end recipients (e.g., a construction firm hired by a block to build a new sustainable-diet rooftop restaurant), (2) the consumers who receive better products and services (e.g., people who eat at the restaurant), (3) the block members who benefit from any growth the investment produced (e.g., residents of the block who own tokens), (4) the Spectra-wide cooperative which retained some equity stake in exchange for the loan (e.g., members who own Spectra tokens), and (5) any other workers, managers, or part-owners who maintain and operate the outcome (e.g., restaurant employees). Since everyone contributes to the Community Fund and everyone in the cooperative owns some tokens, everyone benefits predistributively from the investment; there is less need for additional taxes to correct profits after the fact.

However, redistributive tools are necessary when predistribution is insufficient at eliminating inequalities and replenishing the Community Fund. LVR will be a primary source of this funding (See 4.1). Another source could be progressive taxes, though they would depend greatly on negotiations with the host country of the physical city—especially any taxes on income, wealth, and inheritance. A carbon tax, carbon border mechanism, and other environmentally oriented policies could be carrot-and-stick sources of funding: creating incentives for firms which develop, operate, or supply the city to be carbon neutral (carrot), punishing firms that do not (stick), and even financing sustainability projects to improve the carbon footprint of the city and/or host country (bonus carrot).

The majority of these redistributive tools should be administered locally, but have their lower threshold be determined at the city layer. Otherwise, local rates could create a 'race to the bottom' effect where each block is afraid to impose necessary rates to ensure healthy growth because members, firms, and partners may relocate to other blocks.[143] Rates set at the city layer may be slightly lower overall as a result, but they will be consistent. Blocks and clusters can add from there to create the types of communities they aspire to. Spectra will attract healthy investment and earn profits as long as there is money to be made in building sustainable, livable, and affordable cities.

Socialise Bailouts. We Should Socialise Successes, Too,"
https://www.nytimes.com/2020/07/01/opinion/inequality-government-bailout.html; Mazzucato, *Mission Economy*, 51-53.

[143] A similar phenomenon has occurred in France, where income and wealth inequality are soaring and there is no common European tax rate because it requires unanimous decisions. See Piketty, *Capital in the Twenty-First Century*, 232.

# 6 Conclusion

To recap, Spectra aims to build a sustainable, livable, and affordable city for 1M+ people. To achieve this mission, Spectra must overcome obstacles which broadly characterize urban economics: inequitable growth, environmental degradation, and non-participation. As with the Whitepaper, this Economics paper presents Spectra's aspirations and plans at initial inception with the expectation that these plans will be refined by community-led input as the project grows. An accompanying Governance paper will discuss how this community-led process will manifest.

There are understandable doubts about building a new city, going all in on healthy growth, embracing cooperativism, transforming the housing market—the list goes on. Yet, we must strive to create positive change in cities nonetheless. We must design economic solutions for cities we actually want to live in if humanity and the Earth are to live at all in the future. Echoing Costanza-Chock's case for design justice, "We must articulate a vision of the world we want."[144] More than just a city building project, Spectra is a movement to solve existing problems in cities and define a new model of urbanization.

What do you want the future to look like? Come join us in building it.

Website: www.spectracities.com
Discord: https://discord.gg/cGpPpcxhqR
Twitter, Instagram, TikTok: @spectracities

[144] Costanza-Chock, *Design Justice*, 218.