

Community Resilience/Think Resilience Course Notes from Post Carbon Institute (postcarbon.org)

(Based on notes from video transcripts in course. All words attributed to PCI & Richard Heinberg)

Part 1: Our Converging Crises

Intro/Lesson 1

Explore the interrelated crises of 21st century, what citizens and community leaders can do to respond to them.

Examine crises: energy, ecology, economy, equity

Learn to think in systems

Learn necessity of reinventing culture, from consumer to conserver economy

Lesson 2: Energy

Energy, the key to everything, driver in natural and human world. It enables us to live and nothing happens without it. “the ability to do work”

Exists in several forms: mechanical, kinetic, radioactive decay, thermal

Sun’s energy is distributed throughout planet through photosynthesis in plants, animals eat plants, animals eat other animals. Humans biologically get energy from plant and animal sources. We derive energy in other ways: from the sun’s energy stored in coal, solar panels, etc.

Great transformations in human history connect to the way we harness energy.

Fire, Agricultural energy from land, the Industrial Revolution, brought about by expanding fossil fuel usage

Fossil fuels: highly concentrated, easily transported, readily available.

Global energy use per capita has increased 800 percent in last century, we’ve invented many machines to take advantage of the energy, agricultural machines have replaced human labor, freeing people for other pursuits.

Energy is central to our global sustainability crisis in two ways:

1. Depletion: we’re exhausting the supply of fossil fuels
2. Pollution: climate change

These two consequences of burning so much coal, oil, and natural gas make it necessary for us to transition to alternative energy sources quickly.

The best choices are solar and wind, but they have drawbacks—their energy is intermittent.

New energy systems will have to be designed, we have to invest in 3 things:

1. Large scale energy storage
2. Capacity redundancy-generate more energy than we need
3. Demand management—we only use it at certain times

Lesson 3: Population & Consumption

1. Tools to hunt, make shelter, clothing,
2. Agriculture to produce food surpluses, build communities
3. Cities-civilization: centers of knowledge sharing, resource consumption (drew people and resources from countryside) perilous social development, early civilizations tended to collapse

Human populations still were related to nature, whether food was available, etc. Tools, agriculture and language helped but energy (mostly related to firewood) was a limiting factor—only so many trees. Then fossil fuels were discovered and human population greatly increased.

Sanitation and medical care has helped lower human death rate, increased food production, transport food & resources from places of abundance to places of scarcity.

Currently we are adding a net (births minus deaths) of about 80 million people to earth each year (populations of NYC, L.A., Tokyo & Mexico City) which we have to figure out how to feed, house, clothe, care for.

Populations decrease as nations become wealthier; can we reduce population growth by increasing wealth per capita worldwide? Sounds good, but growth in per capita **consumption** is unsustainable. Earth's nonrenewable resources (minerals, metals, fossil fuels) are finite and renewable resources (forests & fish) are being harvested faster than they are being replenished. If everyone on earth lived at the U.S. standard of living we would need 4 earths to sustain us. Within the U.S. there are different levels of consumption based on economic inequality.

Lesson 4: Depletion

Earth's resources:

1. **Renewable**
2. **Nonrenewable**

Resource quality goes down as resources are depleted

Other issues:

Accessibility

Location

Contaminants

Main alternative to market-based resource extraction and distribution is for governments and communities to collaborate on resource management programs.

We've done this with renewables but with nonrenewable resources the human plan seems to be to use them as quickly as possible and hope some economically viable alternatives turn up in time to avert a future economic catastrophe. In agrarian societies, soil nutrient depletion (potassium, nitrogen, and phosphorus) is a problem. In the past, humans recycled waste for fertilizer, but now much of the fertilizer is mined or manufactured from fossil fuels. We need to break our dependence and come up with more viable options.

Lesson 5: Pollution

In nature waste from one organism is food for another.

Human pollution:

Fertilizer runoff

Plastic particles

Air pollution from burning coal

Climate change from

1. Carbon dioxide released from fossil fuel combustion
2. Methane from farm animals and the natural gas industry
3. Nitrous oxide released by agriculture and fossil fuel combustion

We contribute to climate change by burning coal or natural gas for electricity, using oil for transportation, meat-centric diets, industrial agriculture, timber harvesting releases stored carbon.

Carbon dioxide is over 400 parts per million and rising (was at 280 parts per million at dawn of industrial age). Temperature of earth's surface has risen by 1 degree Celsius. Different areas are affected differently. American Southwest is hotter and dryer. A hotter atmosphere holds more water meaning there are severe storms and floods in other places. Sea levels rise as glaciers melt. The most wealthy and powerful nations emit the most greenhouse gases. Many problems arise about who to assign responsibility (example if China burns coal to make goods for American shoppers, should the resulting emissions be assigned to the U.S. or China?)

Climate Change Questions:

1. How can we rapidly reduce the use of fossil fuels without risking unacceptable economic contraction?
2. How can we reduce the use of fossil fuels fairly?
3. How can we protect nations and communities that are most vulnerable to climate change?
4. How can we take carbon out of the atmosphere and store it so as to reduce the severity of climate change?

Session 2 Roots and Results of Our Crises

Lesson 6: Systems of Political and Economic Management

Structure: institutions for making decisions and allocating resources

Infrastructure: means of obtaining food, energy, and materials

Superstructure: beliefs and rituals that supply society with sense of meaning

Historically, social structures and superstructures seem to adapt to changes in infrastructures.

Infrastructure in human history:

Hunting and gathering infrastructure: sharing, owning very little personally, not much accumulating wealth, political power rested on those with knowledge and experience.

Agrarian infrastructure: seasonal surpluses, permanent settlements, full-time division of labor, gradual growth in communities, administrative bureaucracies.

Industrial Revolution Infrastructure: development of technologies to aid in agriculture, transportation, manufacturing. Fuel-fed farm machinery led to rapid growth in cities and urban middle class (more people could do other work.)

Less obvious impacts of industrial age:

Overproduction of goods which led to Great Depression in 1930s.

Solution to overproduction was **consumer economy** tied to continual growth expectations in production and consumption.

Consumerism required psychological requirements from advertising and consumer credit, with debt a pillar of financial economy.

Unprecedented amounts of wealth were generated but concentrated, so to help middle class to keep consuming, the government redistributed money through progressive taxation, retirement benefits, unemployment.

Immigration increased, imports and exports increased. Global economy

Industrial period has seen political systems of capitalism, communism, and socialism administered through democracy or dictatorships. All have used mass communication, propaganda to spread their message.

Political systems tend toward corruption & resistance to change. Complex global and economic system connected to societal infrastructure of fossil fuel industrial period.

Our transition to a world without fossil fuels will be more localized because of less available energy and less transport. Activists, reformers, those who work for social change are needed to help form a new infrastructure.

Lesson 7: Belief Systems

People in hunting and gathering societies were conscious of their roles in taking care of the earth, believed in nature spirits, shamans.

Agricultural/agrarian societies believed in sky gods that were above/apart from nature, tended to be hierarchical because of division of labor. King had direct access to the god and handed down rules for social order.

Industrialism gave way to scientific and secular thought which gave way to the belief in material progress, that everything will improve and expand, wealth will grow, etc.

This was unique to the industrial period. Prior to this, people believed in cycles, as in the cycles and seasons in nature.

Economists are the ones who spread the idea of material progress: the optimal benefit to humanity will be through perpetual growth and expansion. A constantly growing economy was seen as the key to all economic problems (to avoid another Great Depression due to overproduction). Politicians also promised growth, to spread this idea to the masses. The belief in growth and progress was a superstructure created for a certain infrastructure.

Lesson 8: Biodiversity

Humans have largely become disconnected from nature and its importance. As human populations grow, we displace other species and reduce habitat which has led to mass extinction of plant and animal species. Biologists call this The Sixth Extinction or Anthropocene era.

Lesson 9: Collapse

Civilizations pass through cycles of expansion and decline. Jared Diamond, author of the book ***Collapse***, says there are five factors that contribute to civilization collapse:

1. Natural Climate Change
2. Human-caused environmental damage
3. Hostile neighbors
4. Loss of support from trading partners
5. Failure to adapt to environmental issues

Historian Arnold Toynbee, author of twelve volume ***A Study of History*** says civilizations pass through five phases:

1. Genesis
2. Growth
3. Times of Trouble
4. Universal State
5. Disintegration

Toynbee “speculated that societies fail to solve new problems because they have invested so much effort in building elaborate structures for solving old problems.”

Archaeologist Joseph Tainter, author of ***The Collapse of Complex Societies***, ties collapse to diminishing returns:

1. Human societies are problem solving organizations
2. Sociopolitical systems require energy for maintenance
3. Increased complexity carries with it increased energy costs per capita
4. Investment in sociopolitical complexity as a problem solving responses is subject to the law of diminishing returns, so over time society invests more and more but gets less and less benefit, until problems pile up and become overwhelming.

Ecologist Charles Hall and political scientist Thomas Homer-Dixon say societies rely on energy profitability: more has to be returned than was spent.

Ecologist Peter Turchin and historian Sergey Nefedov, in their book ***Secular Cycles***, examine four pre-industrial agrarian societies and see population growth and carrying capacity as the most critical issues, but say sociopolitical factors, such as form of government, can affect societies’ trajectories. Their four phases: Expansion, Stagflation, Crisis, Depression/intercycle.

Financial systems are also subject to cycles with debt accumulation leading to depressions.

Lesson 10: Thinking in Systems

Our problems require thinking systemically in order for us to understand and respond to them.

Systems thinking developed as a science in the second half of twentieth century.

All systems have:

1. **Boundaries:** a separation between inside and outside of system
2. **Inputs:** such as energy and materials
3. **Outputs:** Work, waste, heat, waste materials
4. **Information flows:** from and to environment
5. **Feedbacks:** Negative/balancing like a thermostat, or Positive/self-reinforcing like the proverbial vicious circle. To remain stable, systems need balancing feedback loops but can be destroyed by positive feedback loops.

Examples of systems: The human body: a system comprised of systems; a nation, a city, a company.

It is still common to fail to think systemically: example: global climate is a system, climate change is a systemic problem, but non-systems thinkers try to address the symptoms instead of the cause.

Systems thinking suggests different approaches: reducing fossil fuel consumption, capturing and storing atmospheric carbon in regenerated topsoils. These recognize role of inputs: fossil fuels, outputs: carbon dioxide, and feedbacks: soil regeneration. A systems approach to the problem of climate change could have dramatic side benefits: reducing fossil fuel consumption could result in cleaner air, decrease in lung diseases, regenerative agriculture could make food systems more sustainable and increase biodiversity.

Leverage points (Donella Meadows): a small shift in one thing can produce changes in everything. Meadows says **the most powerful interventions in a system address goals, rules and mindsets** rather than parameters and numbers (subsidies & taxes in human system). We need to look at society's most fundamental paradigms like the assumption of continual growth.

Two other frameworks helpful for thinking about leverage points:

1. In the Shock Doctrine, author and social activist Naomi Klein quotes economist Milton Friedman "Only a crisis-actual or perceived-produces real change." **In order to take advantage of crisis, we must have an effective, system-changing plan waiting.**
2. **Diffusion of innovations theory** (Everett Rogers) describes how, why and at what rate new ideas, social innovations and technology spread. Identify the different individuals in a population—innovators, early adopters, early majority, late majority, laggards

Lesson 11: Shifting Cultural Stories

Society's goals and mindsets are stories we tell ourselves. Some cultural stories are deeply ingrained. We may need to tell an alternative story.

1. **Shift from consumer economy to conserver economy.** Consumer economy is an artifact of the 20th century when overproduction was a problem: the solution was to stoke demand with advertising and consumer credit. Governments called citizens consumers and the health of the economy was measured by consumption rates. In our future, with scarcer resources, this story doesn't make sense. Foster a **conserver economy**, minimize consumption. Move away from the story that things make us happy and **focus on relationships and experiences.**

2. **Shift from perpetual economic growth to steady-state economy/ecological economics.** (*Doughnut Economics* by Cynthia Raworth)

3. **Shift from corporate hegemony to distributed ownership and increased equity:** cooperatives, non-profits

4. **Shift from population expansion to stabilization and decline:** Desire for more children is rooted in cultural stories from previous eras when resources were abundant and childhood mortality rates were high. Higher number of children confers higher social status among men in many societies. Stabilizing the population largely will come from raising the social and economic status of women and overcoming religious and cultural notions that no longer reflect the world we live in.

5. **Shift from politics of mass persuasion to a politics of local engagement:** the elite of every society aim to influence the opinions of ordinary people. Citizens are dumbed-down, manipulated, resulting in political polarization, lack of governmental accountability and institutional gridlock. Instead we need to be locally engaged and skilled in critical thinking.

6. **From nature as resource to nature as source:** Rather than see nature as resources to plunder, see nature as the source of our existence, that we are responsible to care for. **We need to raise the level of eco literacy—appreciation of nature's beauty and understanding how it works.** This more mature relationship with nature can be a motivator for changing other cultural stories.

Lesson 12: Cultural Change and Neuroscience

Humans are both selfish and sociable

Neuroscience tells us that:

selfish behaviors are wired deeply into survival mechanisms in the primitive brain.

Cooperative behaviors are also connected to our evolutionary past but self-restraint and empathy are partly learned behaviors acquired and developed in the same way as our capacity for language. Both selfishness and altruism are inherited, but culture moves us toward cooperation.

Evolutionarily, **status** is a way of minimizing competition. We are wired to respond to **novelty** as either a potential threat or reward. Novelties increase dopamine in the brain, a system which can be hijacked by addictions. Addictions to acquiring status symbols are hard to overcome due to our brain chemistry. Human societies have learned to tame reward-seeking behavior through cultural behaviors geared toward self-restraint and empathy for others. Thrift, frugality, prudence, the willingness to sacrifice on behalf

of the community are functions of the neocortex. Traditional human societies had moral guidance in the form of myths and stories to foster pro-social behavior. When a culture ceases to provide this moral guidance, these values become eroded. Consumerism has replaced many of these culturally learned values.

Humans also have a tendency to discount the future, and make decisions based on present threats and opportunities, making it difficult to sacrifice now for an enormous future threat like climate change. People in wealthy nations suffer from lottery winner's syndrome: we are actually less happy, experience less well-being, overwhelmed by choice and excess, relationships suffer, pursue addictive and high-risk behaviors, we become more socially isolated and feel less empathy toward others (like those in poorer communities or nations)

We need to find long-term ways to heal our culture so that it once more teaches self-restraint and empathy. In the short term we probably can't change people's tendency to want more, but as resources decline, people may be more open to a different definition of what more means.

Look for ways to motivate people that work with human nature

Can we harness both the competitive and cooperative aspects of human nature and change the cultural stories in which high status and reward are tied to habits and behaviors that promote healing, sharing, giving, creating, growing, conserving and thriving within constraints? Can we make those behaviors ones to look up to?

Lesson 13: Resilience Thinking

Resilience is the ability to withstand hard times or shocks and to bounce back from disaster. When talking about resilience, we are really talking about systems, such as a group of relationships. Example: a town is a system of relationships between people, businesses, institutions and infrastructure. A forest is a system of relationships between plant and animal species, water and nutrient flows and climate patterns.

In ecology, resilience is seen as the ability of a system to absorb disturbance and still retain its basic function and structure: the qualities that define what it is and what it does, the system's identity. Example Ponderosa pine forest, parts patterns and relationships interact with each other in ways that are not always predictable: complex adaptive system.

What makes a system resilient? Ability to adapt to short-term disruption and long-term change while retaining system's essential identity.

Building resilience starts with what we value in a system.

The resilience of any one system is influenced by the resilience of everything around it.

Lesson 14: Community Resilience in the 21st Century

E4 Crises: 1. Ecological 2. Energy 3. Economic 4. Equity dimensions

Relationship between Sustainability and Resilience:

Sustainability: a condition in which human society doesn't degrade ecosystems

Resilience is about adaptability in the face of disturbance. (We need to be both!)

They work together: a major factor in resilience in human systems is to make them more sustainable. Example: reducing fossil fuel usage today, society will be more

sustainable by reducing climate impacts and more resilient by reducing economic fallout from gas, oil, coal depletion and boom and bust cycles in fossil fuel markets. Likewise, a sustainable society must be able to adapt—be more resilient.

We need to think broadly and deeply—our challenges are multidimensional and global. Concept of panarchy: events at one hierarchical level of systems affect others at higher or lower levels in the system. So interventions can be made at any level. We need to think about all the levels from global systems down to the household. We can make changes in our personal lives, but also need to work together as communities to maximize impact.

Two reasons why getting involved building resilience at the community level makes sense:

1. Because of how our political system is structured. New ideas/making changes at the federal level happens very slowly. Local and state governments have more flexibility in public decision making as well as significant regulatory and investment power over the issues that most affect everyday life: social services-health care, utilities, schools, courts, land use, transport planning, etc.

Local innovation works as well as it does because most of us directly interact with people and institutions in our communities; it's where we are most affected by decisions society makes, available jobs, infrastructure, policies that limit or empower us. It's where most of us who don't wield political or economic power can most directly affect society as voters, neighbors, entrepreneurs, activists, shoppers, local officials.

- 2. The second reason is it's ethical and practical for community members to get involved in community resilience work: everyone is a stakeholder and stakeholders need opportunity to participate and to have some responsibility for it.** (rather than the central government attempting to direct this work.)

Why it's important for local stakeholders to have real power in decisions that affect them:

- a. **Identity:** the identity of the community comes from its members, who have an inherent right to self-determination
- b. **Social capital:** a community's collective relationships, wisdom, and capacity to organize.
- c. **Feedback loops:** how parts of system learn and respond to what's happening in other parts of a system. If feedback is too weak or slow, the system can be overwhelmed by change before it has a chance to respond.

Lesson 15: Six Foundations For Building Community Resilience

1. **People:** the power to envision the future of the community and build its resilience resides with community members. Goals are best focused on the needs of the people who make up the community, not just the most politically engaged or powerful stakeholders. It means community members have to get involved as active participants. Shared sense of place, shared sense of identity, shared sense of values

2. **Systems Thinking:** understanding the complex, interrelated crises we face, and what they mean for our communities. “What are you trying to do, and what are the consequences? It’s thinking about how one action here affects whole.” (Doria Robinson Urban Tilth Oakland) We can’t know everything we want to know. There’s more than one way to look at things-diverse views and interests.
3. **Adaptability:** a community that adapts to change is resilient; but because communities and challenges we face are dynamic, adaption is an ongoing process. “In a time of drastic change, it is the learners who inherit the future, the learned usually find themselves equipped to live in a world that no longer exists.” (Philosopher Eric Hoffer) Resilience is a quality to continually cultivate, not a goal to be achieved.
4. **Transformability:** some challenges are so big that it’s not possible for the community to simply adapt; fundamental, transformative changes may be necessary. To keep some of the things you care about, you sometimes have to give up other things. If adaptation happens too slowly, challenges can build up and outpace our ability to cope and eventually will threaten resilience. Resilience building tries to maintain basic function and structure of system in the face of disruption, but transformation efforts disrupt system on purpose to build resilience to match a new reality.
5. **Sustainability:** Community resilience is not sustainable if it serves only us, and only now. It needs to work for other communities, future generations, and the ecosystems we depend on.
6. **Courage:** to confront challenging issues and take responsibility for our collective future.

Lesson 16: How Globalization Undermines Resilience

Community economics: in some ways economic resilience is the opposite of economic efficiency (reducing cost as low as possible, specialization, economic stratification, ex: if you can grow corn cheaply in Iowa than elsewhere, you should grow all your corn in Iowa and Iowa should do nothing but grow corn.) Reducing economic diversity may be efficient, but it’s not resilient. Most of the payoffs go to the company pursuing the race to the bottom, but costs go increasingly to society as a whole. For the U.S., globalization has resulted in offshoring manufacturing that would have occurred domestically. Long supply chains are another problem. In the future we won’t have access to cheap fossil fuel based energy so we will need to localize manufacturing and food production as much as possible.

Lesson 17: Economic Relocalization

Local economy in four main sectors:

1. Food-localizing food production should be a high priority
2. Manufacturing-wherever it can be reduced in scale and plugged into local supply chains
3. Retail—promote/support local enterprise
4. Local investing and exchanges

Lesson 18: Social Justice/Equity/Ownership

Inequality: where does it come from

1. Capital: money and goods set aside for making more money and goods, tends to reproduce itself and become more consolidated and centralized over time, which is its purpose. But only some members of society are motivated or able to set aside money and goods for the purpose of capital accumulation. Some people lend, some need to borrow. Money flows from borrowers to lenders. Over time, without rebalancing, the level of inequality in society will tend to increase.
2. Inequality is created, sustained or worsened over time through institutionalized racism, which results in chronic conditions of poverty and lack of access.

Internationally, the richest nations own the banks and corporations, the poorest nations borrow from the rich nations and wealth and resources flow from poor nations to rich nations.

On a local level, sometimes local banks and businesses are owned by just a few families, who become the leaders and power brokers. The local consolidation of wealth can be addressed through profit sharing and cooperative ownership of businesses. How do we improve equity? Industrial nations have used progressive taxation, public spending on healthcare, pensions, unemployment insurance, but that's not enough.

Let's think about the commons—the cultural and natural resources that are accessible to all members of society, not privately owned.

In pre-industrial societies, this included sources of food and natural materials for making tools and shelters. Everyone who used the commons had a stake in preserving it for future generations. During Middle Ages, common lands were gradually enclosed by fences and claimed by those wealthy and powerful enough to defend their appropriation by law or arms. During the past century, the trend of privatization has spread around the globe. The result is that people who would've been able to subsist on common resources must now buy or rent access to basic necessities.

Promoting equity by expanding commons once more. Ethical basis: no human made land, rivers, deposits of gold, iron ore, fossil fuels, etc., through their own labor. So why should a person or corporation be entitled to extract wealth from natural resources for purely private benefit? An alternative is a commonwealth—all natural resources are public goods owned and protected in common. This will require time and changes in public policy.

There are immediate, specific ways to build equity in communities through common ownership: cooperatives, owned by workers, which foster voluntary and open membership, democratic member control, member economic participation, concern for community, have potential to avert overuse of resources by placing other values, ex. concern for future generations, over profit.

Lesson 19: Education

We need education that trains people (young and old) in community and personal resilience building.

Young people in particular need training in systems thinking, adaptability, creativity, and practical skills: Critical thinking, self-reliance, cooperation, understanding basic human systems (food, water, energy) and natural ecosystems, learn a wide range of practical skills.

New curriculum design needed, move away from standardized testing, resilience-building will require engagement of multiple intelligences

The Center for Ecoliteracy designed garden-based schooling where children learn basic principles of ecology, nutrition, and critical thinking while developing math, verbal, and physical skills while engaged in hands-on, project-based, cooperative, experiential learning activities.

Self-directed, holistic forms of learning in alternative schools, charter schools, homeschools.

Lesson 20: Meeting Essential Community Needs

Food resilience:

Factors:

1. Long food supply chains reduce a community's resilience. How much of our community's food is imported from 100 miles or more? Can we increase local food production and reduce food miles?

2. Local farms' reliance on imported and unsustainable inputs: fertilizers, pesticides, herbicides made from fossil fuels

Water: key to water resilience is the health of natural regional lakes, rivers, streams.

Planning for water emergencies

Energy: more resilient system will rely on alternative, renewable, local sources solar, wind, geothermal, hydro. This shift will require changes in the way we produce and the way we use. Local democratic control over energy.

Money: fragile money system poses many risks to community, keep money local

Lesson 21: Resilience in Major Sectors

Manufacturing-localize

Transportation-reduce oil consumption

Buildings-make existing structures more energy efficient, energy retrofits

Land use planning for walking and bicycling

Public policy

A few ways to take action

1. Lead a Think Resilience discussion group with friends and neighbors

2. Assess your community—resilience assessment

3. How-to guides from Shareable.net

4. Transition Streets curriculum: project combating climate change at a household level

5. readytogether.net A regenerative approach to preparedness and resilience

Additional quotes/resources:

Quotes:

“To be an effective agent of change does not mean we have to know everything.”
-Terry Patten (quote seen on gratefulness.org)

“...imagine a different relationship, in which people and land are good for each other.” (from the preface of Braiding Sweetgrass by Robin Wall Kimmerer)

Books:

From What Is To What If by Rob Hopkins
Braiding Sweetgrass by Robin Wall Kimmerer

Podcasts

From What If To What Next podcast by Rob Hopkins
<https://www.patreon.com/fromwhatiftowhatnext>

The Permaculture Podcast with Scott Mann
<https://www.thepermaculturepodcast.com>

What Could Possibly Go Right?
<https://www.postcarbon.org/what-could-possibly-go-right-series/>

& More:

Movement Generation Justice & Ecology Project
<https://movementgeneration.org>

From What Is To What If Campaign
<https://www.transitionus.org/whatif>

Permaculture Women's Guild
<https://www.permaculturewomen.com>

Groundswell Center for Local Food & Farming
<https://groundswellcenter.org>

Doughnut Economics Creating City Portraits
<http://doughnuteconomics.org/Creating-City-Portraits-Methodology.pdf>