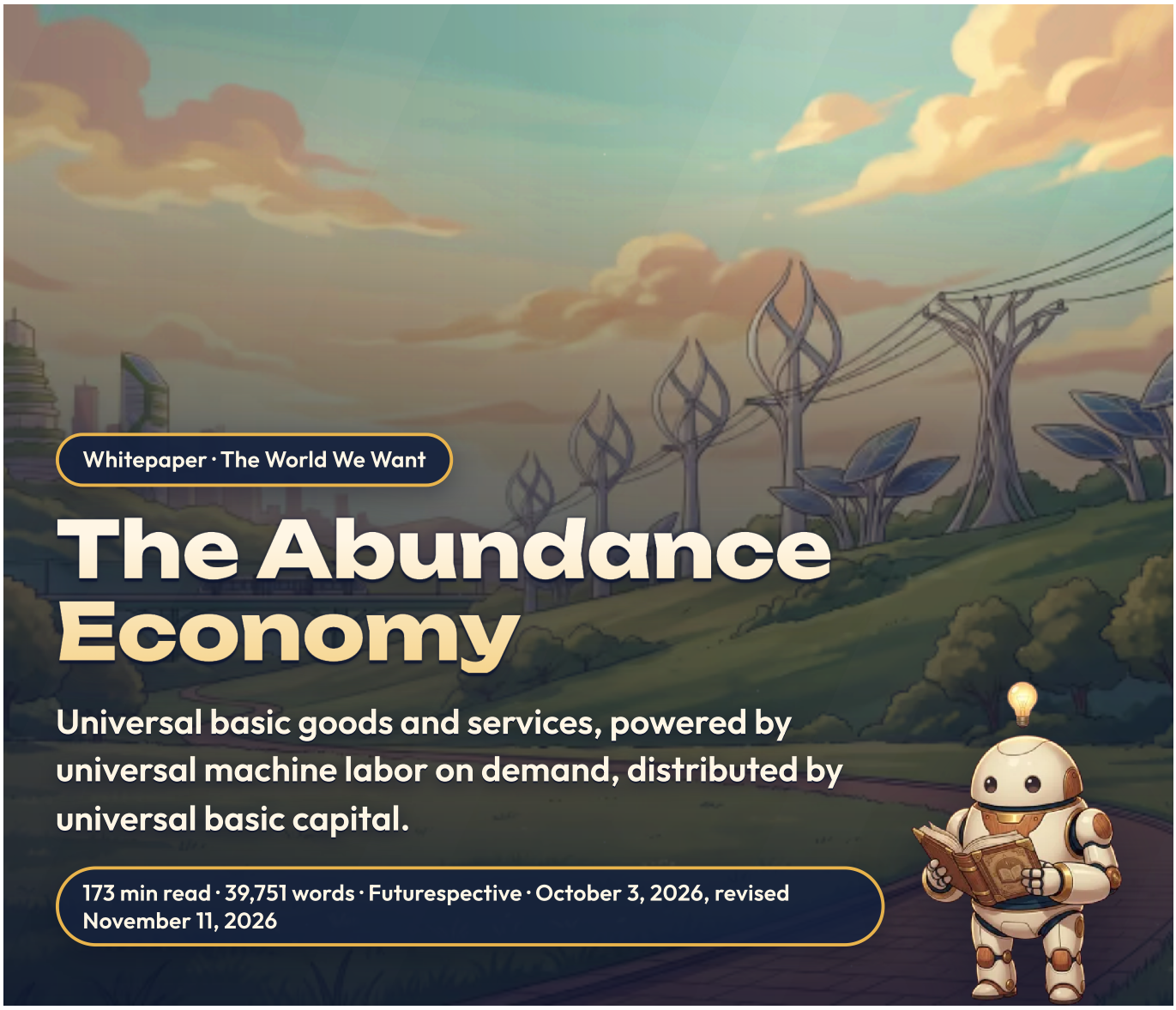


Summary

This paper proposes three universal pieces, and they follow one pattern:

- **Universal basic machine labor: the power.** Machine labor on demand, for all. Everyone has an equal right to call on it, and it's distributed by demand: essential infrastructure need first, community projects next, then quests (projects with a goal and an end) and private wants from the surplus. Everyone's base is a personal machine they own.
- **Universal basic goods and services: the floor.** What the machines make: a free lifeline block of everything reasonable that's available today, organized as seven essentials, plus personal machine intelligence and personal machine labor.

- **Universal basic capital: the ownership.** One equal share per person that can't be sold but moves with you. It's ownership in the systems that produce the things we need to survive and power the goals we want to pursue.

One rule sits over all three: ***if a human wants to do it, a human gets to do it.*** Machines guarantee the floor; people choose their work.

Why this matters now

The AI industry has spent years pitching capability and checks: artificial general intelligence, intelligence explosions, dividends. It has rarely said what changes in daily life, and people have noticed. In June 2025, 50% of American adults said they were more concerned than excited about AI's growing role in daily life, and 10% said the opposite, up from 37% concerned in 2021. A year later, the figures were 52% and 9%.

The backlash is a pitch problem. The right pitch is daily life: humans keep the work they want, everyone gets the things rather than a check, and everyone owns a share of the machines, with a right to use them that no town can take away. This paper is that pitch, worked out in detail.

Freedom and safety are twins

The world we want lets us do anything we want. That takes freedom and safety together, and machine labor delivers both from one source.

It also reshapes the oldest fight in economics. Capital becomes **safety**, because everyone owns a stake in the machines that make the essentials, and the essentials themselves are everyone's by right. Labor becomes **freedom**, because work becomes something you choose.

> **Capital and labor were enemies. Safety and freedom are twins.**

The model is the power grid, not charity

The US power grid runs two systems at once. Behind the meter is one of the most efficient markets ever built. At the house is infrastructure: stable prices, a protected basic amount, and in much of the country, wires the customers own.

This paper copies that structure. Towns trade surplus in a regional market priced by location. Households sit behind a free lifeline block and never see the wholesale price. And the machines belong to the people they serve.

The stance

Doomers want a brake. Accelerationists want a gas pedal. Worldbuilders want a steering wheel. This paper is a steering wheel: short-term practical, long-term optimistic, built in prototypes that get tested before they scale.

The worldbuilder's creed has five lines:

1. Direction, not speed.
2. Machines belong to the places they serve.
3. Builders get their return, then give it back.
4. Abundant flows, conserved stocks.
5. Once safe, free to aim at the stars.

The goal fits in a line: *a floor for everyone, a frontier for anyone.* The floor frees people for what no machine replaces in us: **curiosity and care (service).**

What this paper specifies

This paper specifies the mechanics. It answers one question: when one town has a surplus and another has a shortfall, what moves the goods, who owns the machines, and who decides?

The design in brief:

- **Ownership, split for safety.** Your share is your membership in the trusts. Half sits in your town's trust and half in the federation of town trusts, so one disaster can't wipe out a town's stake. It starts on day one.
- **Four owners, no sovereign.** Ownership follows the nature of the thing. Town trusts hold the essentials, and the federation of town trusts holds regional plants. Guilds (people grouped by craft) hold their craft's capital, parties (teams that form to finish one quest, then disband) hold what their quests build, and you own your personal machine. Using machine labor is a separate right that belongs to you, not to your town.
- **Prices above the floor.** Use above the free lifeline block is priced, like utilities, and that revenue pays for maintenance first. Machine time carries no routine fee. In a shortage, a temporary conservation flag puts the essentials first.
- **A second ledger beside money.** Resource accounts record what each community physically has, makes, uses, and loses. Towns trade surplus for surplus on one netted account, settle the difference in dollars, and draw on a need-weighted shared reserve when they have nothing to sell.
- **A transition planned for the worst case.** Three switches, set in law ahead of time, respond to the data: a universal monthly cash floor, phased in, that jumps to full size if wages fall and

shrinks as essentials move in kind. Pilot town pairs come first, and every stage advances on triggers, not dates.

How to read this paper

The core design comes first and defines each mechanism. Seventeen numbered sections follow. Each opens with its argument and closes with deep dives for readers who want the evidence and the mechanics.

Part	Sections	Question it answers
Core design	Before Section 1	How do the three universals, the rule, and the four kinds of owners fit together?
Diagnosis	1–2	What can't money see, and what is real wealth made of?
Design	3–7	How do resource accounts, prices, forecasts, allocation, and governance work?
Evidence	8	What happened when people tried pieces of this before?
Implementation	9–10	What does the law allow, and how do we get from here to there?
Stress tests	11–13	What are the objections, the system dynamics, and the open questions?
The literature and the transition	14–16	What do AGI economists predict, how do we survive the transition, and how do we pay for it?
Appendices	A–F	Corrections to the first draft, data standard, worked example, glossary, reading list, credit specification

The core design: three universals, one rule

Every economy before this one asked who gets the bread when there isn't enough. Machine labor changes the question to how we distribute what's abundant: who controls the inputs, and how the outputs reach everyone.

The economics of AGI has converged on an uncomfortable answer. If machines can do the work growth depends on, labor's share of income falls toward zero, and whoever owns the machines ends up owning most of what the economy produces (Restrepo, 2025; Trammell and Korinek; Trammell and Patel, 2025). So ownership is the question that decides everything else.

Google DeepMind's Julian Jacobs and Alex Imas coined the answer's name. In *Economic Policy for AGI*, they define universal basic capital as "state-facilitated provision of an ex-ante asset or equity

endowment." Their panel scored it first of 11 policies on agency (76.3 out of 100) and first on ownership of the gains (94.9). It isn't best overall: it ranked 10th of 11 on feasibility (33.1). This paper's version is built to fix that weakness.

Theirs is a share in a national fund of stocks and bonds. Mine is a share in the systems that produce the things we need to survive and power the goals we want to pursue: the machines and their input resources, held by the people who use them, piloted first, and paired with a lifeline block.

The rule over all three is the design's first principle: *if a human wants to do it, a human gets to do it.* Machines fill whatever's left.

The minimum viable design

At its simplest, the whole system has four parts:

1. **Ownership, split for safety.** Your town's trust holds the infrastructure that makes everyone's essentials, and your membership in it is your universal basic capital share: one per person, equal, unsellable. Half your share sits in your town's trust, which gives you a stake and a say. Half sits in the federation of town trusts, the pooled regional fund, which spreads the risk. A flood or a failed plant in one town can't wipe out its residents' capital along with their jobs and homes. (Enron's employees held much of their retirement savings in Enron stock; when the company collapsed, they lost both at once.)
2. **A lifeline block.** Each household's first block of the essentials is free, at all times, sized by a base for the home plus an equal amount for each person who lives there: everything reasonable that's available today, at today's quality and level of production. Above the block, use is priced at what it costs the town to supply, the way utilities bill for use beyond a baseline. That keeps a price signal at the margin without policing anyone.
3. **Machines guarantee the floor; people choose their work.** Machines run the essential systems reliably. Wherever a person can do the work safely and adds something by doing it, people step in, and machines fill whatever they leave. Everyone gets a personal machine of their own, and machine labor carries no routine fee.
4. **Maintenance first, then dividends.** Revenue from use above the block and from surplus traded with other towns pays first for maintaining and replacing the machines, budgeted from the wear their meters record, then for expanding them, and only then for dividends. It's how electric cooperatives have stayed solvent since the 1930s: members' rates keep the lines up (Section 4).

Two supports make it run: resource accounts, starting with the meters utilities already have (Section 3), and a safety net with three switches that covers the years before the floor exists (Section 15).

Everything else (need-based credits, forecasting points, reserve commitments between regions, detailed governance procedures) is a **mechanism to test**: added only where pilots show the simple version falls short. Dispatch rights aren't on that list. They're a right, not an experiment; what pilots test is how towns run the tiers.

Why start this simple

Complex systems that work almost always evolve from simple systems that worked; complex systems designed from scratch rarely work at all. That's Gall's Law, and the history in Section 8 bears it out. Technocracy and Cybersyn were blueprints. WIR, Mondragon, and the electric co-ops grew from small beginnings.

James C. Scott's *Seeing Like a State* adds a warning: grand schemes designed to make life legible from above tend to destroy the local know-how that makes things work. And Elinor Ostrom's principles say rules should fit local conditions and be written by the people they govern.

So the minimum viable design fixes only what has to be the same everywhere, and leaves the rest to local invention.

A charter of eight commitments

Every town trust's charter contains only eight commitments:

1. **The floor, served to all.** The lifeline block, at or above the national minimum, served to every resident equally. The trust can never condition the floor, or access to machine labor, on politics, speech, guild membership, or anything else. The charter also writes down the resource limits that switch on the conservation flag, and reserves a minimum share of surplus machine capacity for quests (tier 3), suspended only while a flag is on.
2. **One share each.** One member, one equal, unsellable, and portable share, split between the town trust and the federation of town trusts.
3. **One vote each.** One member, one vote on the trust's rules.
4. **Open books.** Resource accounts visible to every member.
5. **Maintenance first** in the use of revenue.
6. **The right to exit,** for members and for the town. A town that leaves takes its infrastructure and records after a notice period, once it has settled its share of outstanding federation loans and public build-out funds.
7. **Open membership from day one.** Anyone who registers as a resident is a full, equal member the day they arrive, in one town at a time: the one where they mainly live. Growing towns get first priority for new build-outs of goods and services, so newcomers never thin out anyone's essentials, the way issuing new stock dilutes every existing share. Food, water, energy, care, and compute start that day. Housing can't be built that fast, so a newcomer to a full town is

housed, at the federation's cost, in a nearby town in the federation while they join the local queue, in order of application, never by length of residence.

8. **A narrow purpose, with checked power.** The trust owns and maintains the infrastructure for the essentials and delivers the floor, and has no other powers: no police power, no taxing power, no zoning, no say over speech. It stays separate from local government. Its keys are separated, its audits are run by members chosen by lot, and any officer can be recalled.

Everything else, from citizens' assemblies to need-based credits, is a town's choice from the menu in Sections 4 to 7.

Four owners, no sovereign

A design that gives one town body the machines, the floor, the priority list, and the votes would rebuild the very thing this design exists to prevent: a monopoly on machine labor, only municipal. Small polities are the easiest to capture. James Madison argued in Federalist No. 10 that factions take over small republics more easily than large ones. The company town is the clearest warning: in Pullman, Illinois, one owner controlled the jobs, the homes, and the rents, and it ended in the strike of 1894.

So ownership follows the nature of the thing, while using machine labor stays a right of each person (guard 3). That makes four kinds of owner: the trusts, which hold places at two scales (each town's trust and the federation of town trusts), guilds, parties, and persons. Place-bound things belong to places, crafts to guilds, projects to parties, and persons own their own.

Holder	Holds	Why it belongs there
Town trust	Place-bound infrastructure for the essentials: water, power, the shared fleet that runs the machine-guaranteed systems, and community land trusts for housing	Pipes and wires are natural local monopolies, which is why utilities and co-ops exist. Physics puts them in a place
Federation of town trusts	Regional plants and services: the fab, the grid backbone, compute cooperatives, shared reserves of machine labor and other resources, and the essentials too big for one town, like specialty hospitals, medicines, and regional transit	Too big for one town. It runs the market between towns but owns no town's infrastructure
Guilds	Their craft's capital: specialized workshops, tools, and machines, including a fleet of its own if the guild's charter needs one; the craft's training data and models, owned by their contributors; certification, leagues, and collecting rights	A craft spans many towns, and its knowledge shouldn't belong to any one of them
Parties	What the quest builds, plus the machines and equipment the quest needs while it runs; members share the spoils. One exception: place-bound infrastructure for the essentials, like a water plant or a microgrid, transfers to the town trust under a build-operate-transfer handover agreed up front, with a capped return shared by the members	The output belongs to the people who made it

Holder	Holds	Why it belongs there
Persons	Their personal machine and the tools built for their work, their share, their skill map and quest log, their data	The base layer of freedom

One rule covers every holder, whether trust, guild, party, or person: **you hold what you use.** Idle capacity of trust, guild, and party machines returns to the open dispatch system, where anyone can call it (guard 2, below). Standard machines bought with trust or federation money (excavators, haulers, general-purpose robots) also offer a fixed share of their hours to open dispatch, while fragile precision tools stay with the shop that maintains them. The share is set in the charter (a quarter, say), so no one can keep a shared machine "busy" to keep it out of the pool. Machines a guild or party buys itself owe only their idle time. The one exception is your personal machine: nobody can call it unless you lend it, because your companion, the personal machine intelligence that knows you, holds your memory and lives in your home.

Lending and wear. When dispatch sends out a machine a guild or party holds, the shared maintenance pool covers its energy, repairs, and metered wear while it's out, logged on the fund accounts. Lending never costs the holder, and nobody earns rent on it, which keeps machine labor free of routine fees. A machine past its service interval can't be lent; maintenance that's already due stays with its owner. As with any request, materials and energy a project uses beyond its members' lifeline blocks are priced, and that revenue goes to maintenance first.

Markets and private firms stay above the floor. Builders, including startups working as parties, build towns' infrastructure under contracts that hand it back, and trusts buy from private suppliers. Private industry becomes a partner and supplier, not a casualty.

Four guards that keep the town from becoming the state

1. **A narrow charter.** The trust is a utility cooperative, not a government (charter item 8), and it's separate from the town council, the way an electric co-op is separate from city hall. It must serve everyone; it isn't a landlord that decides who gets to work.
2. **An obligation to serve, without discrimination.** This is the most important guard. The grid has a precedent: in 1996, the Federal Energy Regulatory Commission's Order No. 888 required utilities that own transmission lines to offer everyone open, non-discriminatory access on the same terms they give themselves. The dispatch system works the same way, as a common carrier for machine labor, open to everyone on equal terms, whoever holds the machines it calls. The same guard carries the use-rights rule above, including its exception for personal machines.
3. **Rights held by the person, not granted by the town.** The floor and dispatch rights belong to the individual, are portable, and are enforceable beyond the town. Otherwise, government works the way it does now, until people vote for something different. This design asks it for one addition: a national minimum floor in law. That's within Congress's power to spend for the

general welfare, and because Washington can't commandeer towns, the federal government runs it itself or states and trusts join voluntarily (Section 9). The national minimum is the appeal when a trust abuses its role, and the federation can step in to run a failing trust, the way regulators put a failed utility under new management. Government gets smaller only as essentials move in kind and the programs they replace wind down: by attrition, not decree.

4. **Unbundling.** The owner, the operator, and the market stay separate. The trust owns the shared infrastructure; machines run every floor service by default, and anyone certified to use the equipment safely can take part, whether a guild, a party, or one person; the federation runs the market. No single body owns the machines, runs them, and sets the terms.

Guilds and parties gain real standing from this arrangement:

- **Resources.** The trust doesn't pay guilds; it equips them. Anyone who wants to provide a floor service, like care, repair, or food, gets the machine time and materials to start, and more resources flow to whoever's output residents actually use, measured at the facility, not by bids. The starting resources stay whatever your rank, so people who do it because it's fun or interesting are never squeezed out. Dollars come as thanks: residents can tip or pay for work they love, and a town can vote extra recognition from its surplus.
- **Capital.** Guilds own their craft's tools and models, and a fleet of their own if their charter needs one; parties own their outputs.
- **A cross-cutting check.** Guilds and parties span towns, so nobody's loyalties all run through one place. Political scientists call these cross-cutting memberships, and they're a standard brake on any one faction's control.
- **Room for quests.** Community votes rank the second tier of machine labor, but the charter's reserved share for the third tier (item 1) keeps a majority from crowding personal quests out. That protects minority projects without anyone policing them. It's what designing for surplus means: build enough that people can do whatever they want.

The result is what Vincent and Elinor Ostrom called polycentric governance: many overlapping centers of authority, none of them sovereign.

Resilience first, regional self-sufficiency later

Many things are vastly cheaper made at scale and traded, including leading-edge chips, steel, medicines, and much of the power supply. Towns that try to make everything themselves end up poorer. So through about 2040, the goal is resilience: each town is sufficient in its critical classes (energy, water, and buffers of food and medicine), runs its essentials through a crisis, and trades for everything else.

Sometime between 2040 and 2050, as microfactories and the scarcity flywheel (Section 2) mature, towns can go beyond resilient: self-sufficient enough to trade their surplus freely, with regional gigafactories working as factory factories that turn out microfactories at scale. At the limit, self-

sufficiency is regional. Groups of towns cover their own needs, with plants sized to the region and built with surplus, so a swing in demand from other towns doesn't create a new scarcity.

One rule decides what goes where: **scale the makers, localize the made.** A few things have to be big because physics, not management, sets their size: leading-edge chip fabs, float-glass lines, the lithography machines that print chips, and the grid's backbone. Those are built once, regionally, and run as utilities by the federation. What they make (microgrids, microfactories, robots) is small, numerous, and run by the towns that use it. So a town's own power is about running its essentials through a crisis, not making every kilowatt-hour itself.

The three universals and the people

The rest of the core design describes the full system the minimum version grows into, and how its pieces back each other up.

Layer	What it is	What it does
The power: universal basic machine labor	Machine labor on demand. Inputs: physical parts, energy, and machine intelligence. Output: labor. Built to peak demand, like the grid	Runs the essential systems reliably; fills whatever work people don't choose to do; gives everyone a personal machine they own, and dispatch rights beyond it, distributed by demand
The floor: universal basic goods and services	Everything reasonable that's available today, at today's quality and level of production, as a lifeline block. Organized as seven essentials: food, water (including sanitation), energy, housing, healthcare, transport, and communication (including education). Plus personal machine intelligence and personal machine labor	Guarantees everyone's essentials in kind, free at all times, with prices above the block
The ownership: universal basic capital	One equal, unsellable, portable share per person: membership in your town's trust (half) and the federation of town trusts (half), in the machines and their input resources	Gives every person a stake (a vote in how the machines are run, and dividends from what's left after maintenance and expansion) without staking everything on one town
The people	Parties for quests, guilds for crafts, and individual contributors	Organizes the work people choose to do, and the standards for doing it well

The capital owns the machines. The machines make the floor. The floor frees people. And people direct the machines, which closes the loop.

Universal basic machine labor: equal access, distributed by demand

Universal basic machine labor is machine labor on demand, for all, "from carrying a crate to reading a health scan". Everyone has an equal right to call on it: their **dispatch rights**.

The base is personal. Everyone has a machine tailored to them, and they own it: their own personal machine intelligence (what we call AI today) and personal machine labor, linked. Put

simply, your computer will be your robot, and your robot your computer.

Personal machine intelligence is part of the floor now. The general-purpose personal robot joins gradually: that evolution begins around 2025 to 2027 and is gradual. As of October 2026, home humanoids are announced, priced, and in production, but not yet in homes at scale.

Outside forecasts agree the gradual part is real. The Android Dreams scenario (November 2025), written by a former engineer on Tesla's Optimus robot, has narrow task robots spreading through 2030 and humanoids taking over manufacturing and farm work from about 2027 to 2032. Robots that can walk into a new home and work without task-specific training arrive only in the 2030s, reaching wealthier households first and everyone else later.

So the floor adds the personal robot as it becomes good and cheap enough. This paper's estimate is that it reaches everyone during Stage 4, about 2035 to 2045. The end state is embodied: a personal machine that can think and do physical work.

Above the base, anyone can ask for more: for a quest, for their guild, or for their community. The dispatch system routes machine labor wherever the load is, the way a grid routes power, but for everything we do, everywhere around the world. It distributes labor **by demand**, in three tiers:

1. **Essential infrastructure need.** The essentials, plus urgent shortages and new bottlenecks, on a stack-ranked priority list. Guild work that delivers the floor, like care, repair, and food, belongs here too.
2. **Community projects.** Guild or party projects the town votes to do first, when the work happens in that town.
3. **The surplus.** Everything else: quests and private wants. This tier keeps its protected share of surplus capacity under each town's charter, and requests are filled by demand, in the order received. When capacity is tight, the people who've used the least machine wear this period go first (see "Wear is counted, not charged" below).

The machines are built for peak demand, so most days every tier gets served. People will always want more than a fair share, and a good design welcomes that. Need is the first tier of demand, not the whole of it.

Two orders, not one. The tiers are the **dispatch order**: they decide how today's machine labor is used. The **build order** (Section 2) ranks the new bottlenecks on the tier-1 list, so each year's floor can be bigger, cleaner, and more local than the last.

Machine time is free; scarce inputs keep a price. Floor work is free, and calling on machine labor carries no routine usage fee and no standing policing. What the machines use up is another matter. Floor work and the community projects a town votes for (tier 2) draw their energy and materials from the trust's budget. A quest or a private project still consumes energy and materials, and beyond your household's lifeline block, those are priced like any other good, at the same utility-style rates. Production for sale is the exception: anything made to sell for dollars runs on its

own meter and pays for its energy and materials from the first unit, at the same rates, so the free block never subsidizes a business. Making things for yourself, as gifts, or for a quest stays inside the block.

Wear is counted, not charged. Every shared machine carries a wear meter: operating hours weighted by load, the way a car's service schedule depends on how hard it's driven. Each person has an equal wear allowance each period, and a party's use is split among its members, so joining more parties doesn't multiply anyone's share. Using machines never costs money, inside the allowance or beyond it. When capacity is plentiful, everyone gets what they ask for. When it's tight, requests from the people who've used the least wear this period go first, so heavy users wait their turn instead of wearing down everyone's machines. The meters also size the maintenance budget, the way utilities fund depreciation from rates. Dispatch keeps one running number per person, reset each period, and its work orders last only as long as scheduling needs them; the resource accounts still record facilities and towns, never people.

That puts the price signal where scarcity actually is: in the inputs, not the labor. When this paper says shared machines can be rented on demand, "rent" means borrowing a machine for a while. The time is free; you pay only for the materials and energy you use beyond your block.

In a shortage, a conservation flag. When the town's resource data crosses limits written into its charter, a temporary conservation flag switches on automatically, the way grid operators issue alerts on hot afternoons. The federation does the same for regional shortages. While the flag is on, requests follow the tiers, essentials first, and the reserved share for quests is suspended. Anyone using far more machine labor or compute than is reasonable during the shortage gets a review by the trust's elected board, with guilds checking each other's work. The flag lifts automatically once supply recovers, and it's never permanent. Building capacity stays the default fix.

Who keeps the list. The town trust keeps the tier-1 list of essentials and shortages. The community votes on it, with input from the guilds, which know where their crafts are short. Regional shortages flagged by the federation feed into each town's list, as do the learning and skill areas society most needs (Section 7). The town trust runs the shared fleet for the essentials, and the federation runs the regional plants. Dispatch also calls idle guild and party machines, so the trust's fleet is one fleet among many.

Reviews without surveillance. A review needs some record of who asked for what, and the second ledger measures flows, not people. The dispatch system's logs square the two. They're operational records, like a work order, kept only as long as scheduling needs them, consulted for a review only while a flag is on, and reported only in aggregate otherwise.

Unsellable, so it can't concentrate. Dispatch rights can't be sold or converted to dollars, so access never pools in a few hands. It also avoids two traps an equal allotment of machine-hours would fall into: machine capacity isn't one uniform unit, and resellable claims grow side markets. With distribution by demand, there's no allotment to trade and nothing to resell.

Leagues buy no one more machines. Every division of a guild league, the ranked competition a guild runs in its craft, has equal access to machine labor. Promotion earns harder opponents and bigger quests, not more machines. Quests are what ask for more.

Universal basic capital: membership in the trusts

Universal basic capital is one equal share per person that can't be sold, but moves with you. It's your membership in the trusts that own the systems making your essentials: the machines and their input resources, from energy and materials to compute.

A **town trust** is the legal owner of a place's essential infrastructure. Membership is by residence, it's one person, one vote, and it can never be sold. Trusts are chartered by the state or formed as cooperatives. The **federation of town trusts** is the trusts' own regional cooperative, the way rural electric co-ops formed shared generation co-ops. It owns the regional plants and holds the regional half of everyone's share.

The industrial age's form of ownership was shares you could buy and sell. This one is a share everyone holds and nobody can sell.

The bundle of rights

Ownership is a bundle of separate rights, and each one goes to a different place:

Right	Who holds it
Use	Every person, as a right of their own (guard 3), not a payout of the share
Control	Members, one person, one vote
Income	Maintenance first, then expansion, then members. Builders take a capped return, earned on output, until the gift-back
Sale	No one

What your share is, and isn't

Your share is your **stake** in the machines: one vote in how the trust's machines are run, and dividends from whatever's left after maintenance and expansion.

It doesn't give you the floor or access to machine labor. The floor, including your personal machine, and your dispatch rights are rights you hold as a person, portable and enforceable beyond the town (guard 3). You'd hold them even if the trust's machines were worth nothing. The share is what you own; the right is what you use.

Not one share of one company. A stake in a single company, even one handed to every citizen, makes the public hostage to that company: anything that hurts the firm, including holding its owners to account, hurts every holder. This share is built the other way. It can't be sold. It's split between two trusts, so one failure can't take all of it. And it isn't tied to any single company: it's a claim on the machines that make your essentials, whoever built them.

The cash floor in Section 15 is something else again: a tax-and-transfer instrument run by government, not a payout from the trusts.

Moving: portable, not tradable

Your share can't be sold, but it moves with you. Moving is registering in a new town, like switching your voter registration or porting a phone number.

- **Your town half** transfers to the new town's trust. No money changes hands between towns when you move. The federation nets arrivals against departures in the background, a "trust swap," and turns any lasting imbalance into build-out priority for growing towns. People are never matched with each other, so no market in shares can form.
- **Your regional half** stays put within the region, and moves through the federations if you leave it.
- **Membership starts on day one,** with no waiting period, and day one counts the same as year twenty. The Supreme Court has struck down both a waiting period for benefits, in *Saenz v. Roe* (1999), and an Alaska dividend that paid more to longer residents, in *Zobel v. Williams* (1982).

Portable membership doesn't fight the right to travel. It advances it.

Housing and land

Housing is part of the floor, not part of your share. It's delivered through community land trusts and housing built early in the build-out. A home is guaranteed; a specific view in a specific city is a scarce want. Housing is a stock, not a flow: a town can't build homes as fast as it can add power or food. That's why charter item 7 houses newcomers to a full town nearby while they wait in a first-come queue. A neutral queue isn't a residency test; what courts strike down is ranking people by how long they've lived somewhere. Scarce land, like beachfront, will likely keep a high price in a private secondary market, outside both the floor and the share.

Three stakes replace the job

Parties form around a goal. Guilds form around a craft. Trusts form around a place. Together they give everyone three stakes in place of a job: **residency** (your trust), **craft** (your guild), and **quest** (your party). Each child also gets a stake at birth, an idea taken from Emad Mostaque (Section 14).

The gift-back

Towns don't start out owning their machines. Builders build them: at first AI-enabled startups ("neo-labs") working as parties, alongside investors, public money, and, increasingly, the community itself.

They build under **build-operate-transfer** contracts. The builder builds the infrastructure, runs it, and transfers ownership to residents in equal, unsellable shares when it hits sufficiency milestones for the critical classes, or on a fixed handover date written into the contract, whichever comes first. Its return is capped, but set high enough to compete with ordinary investment so good builders want the work, and it's earned on what the infrastructure delivers (power generated, water treated), not on what the builder spent, so padding costs earns nothing. Part of the return is held back until the assets pass a condition check a set time after handover, read straight from the fund accounts, so building to last pays and running assets down before the handover doesn't. Highway public-private partnerships already use handback reserve accounts this way. Public money reaches towns through one pipe: **community investment funds**, which build towns' infrastructure and compute cooperatives and then gift them back, instead of mailing checks.

The gift-back is agreed up front and never compelled. A forced transfer would be a taking under the Fifth Amendment, so existing infrastructure is bought back at fair value. A gift-back agreed up front is a bargain; a gift-back forced after the fact is a fight.

There's precedent for building first and giving it back:

- **Carnegie libraries.** Andrew Carnegie funded 2,509 libraries between 1883 and 1929, and towns agreed to pay upkeep of about 10% of the gift each year.
- **Electric cooperatives.** Public loans built the lines in the 1930s; members have owned them since (Section 8).
- **GPS.** The US military built it, then opened it to everyone: sell first, open eventually.

The daily throttle

Machine labor on demand runs in two kinds of domains.

- **Machine-guaranteed domains** are the essential systems where reliability can't depend on who shows up: water, power, sanitation, emergency care, and medicine supply. Machines run them at full reliability. People oversee and verify them through guild roles, but the floor never waits on volunteers.
- **Human-optional domains** are the ones where a person can step in safely and often adds something by doing so: cooking and baking, gardening, crafts, teaching, care, and repair. Here the throttle works daily. People choose what they want to do; parties post their quests and guilds post the work their members are taking on; machines fill whatever's left. If the bakers'

guild is short-handed on a Tuesday, the bakery's machines run longer. If a party of volunteers takes over the orchard harvest, the harvesters stay parked.

This is the human-will rule as an operating procedure. We humans will always want things to do, though not the same things, and not every day. The throttle lets people work on the days they want and rest on the days they don't, because machine labor covers everything else. People can also do this work from a distance by **remote piloting**: steering a robot over a network, the way a drone pilot flies a drone, so a retired machinist can run a repair in a workshop across town from home. Remote pilots work within the same jurisdiction as the machine, so the work, any pay for it, and the law that governs it stay local, and the work doesn't drift to whoever can pilot most cheaply on the other side of the world.

The human-will rule, in full

The rule is *if a human wants to do it, a human gets to do it*, wherever doing so doesn't put the essential systems at risk. Four clauses complete it:

1. **The final call stays human.** On choices about values, machines calculate and people decide.
2. **It's a right to do the work, not to be paid for it.** The floor carries everyone, so nobody needs a wage from the work they choose (Section 14).
3. **A companion rule against harm.** Machines aren't used to harm the people, or creatures, who live somewhere, and they may refuse such work. The next subsection builds that into the machine itself.
4. **It's a security feature.** A world where humans keep the right to do the work is one where power still has to ask permission.

When more people want a role than a project needs, the party chooses, the same way it chooses everyone else.

Maximum safety: machine intelligence that's safe by design

If everyone owns a personal machine and can call on whole fleets, safety can't live only in rules around the machines. It has to live inside them. This paper's standard is **maximum safety**: values built into the core of machine intelligence, as part of its central nervous system, so every action passes through them the way a reflex passes through the spine.

The core is six laws. The first four are Isaac Asimov's, from his robot stories; the fifth comes from the Bulgarian writer Lyuben Dilov, who added it in 1974; the sixth is this design's first principle (Laws of robotics):

0. **The zeroth law.** A machine may not harm humanity or, through inaction, allow humanity to come to harm.

1. **The first law.** A machine may not injure a human being or, through inaction, allow a human being to come to harm. In this design, that includes never helping anyone cause mass casualties, whoever gives the order.
2. **The second law.** A machine obeys the orders people give it, except where they would conflict with the first law. Under the companion rule, that includes refusing to harm the people or creatures who live somewhere.
3. **The third law.** A machine protects its own existence, unless that conflicts with the first or second law.
4. **The fifth law.** A machine always identifies itself as a machine. It never deceives people or impersonates a human.
5. **The sixth law: the human-will law.** If a human wants to do something, a human gets to do it, and the machine steps aside. Every machine intelligence respects this, within the laws above: wanting to harm other people never counts.

The fifth law already has a foothold in real law. Since August 2, 2026, the EU AI Act's Article 50 has required systems that talk with people to tell them they're dealing with AI.

The laws work as a set, and each covers the others' edge cases. On its own, the zeroth law could justify overriding a person "for humanity's good"; the human-will law blocks that. On its own, the human-will law could excuse harm; the first law blocks that. Asimov's own stories are mostly about how the laws fail at the edges, where "harm" is ambiguous. And today, nobody can yet guarantee that a neural network will always follow a rule. So maximum safety is an engineering target, built in layers that each catch what the others miss:

1. **Values in the model.** The laws are trained into the model's core, and interpretability research checks that they're really there.
2. **Limits on action.** Before a machine moves, a separate layer checks the action against hard physical limits on force, speed, and proximity to people, like a circuit breaker. These limits live in tamper-evident firmware in the machine's motors and controls, separate from the model, because anyone who owns an open model can retrain its values away. Trained-in values are the default; the firmware is the floor. The limits for each kind of work come from the guilds and domain experts who know it (Section 7). In shared spaces, a machine can prove its limits are intact before it's allowed to work there.
3. **Identity built in.** Every machine discloses that it's a machine, in every channel, by design.
4. **The final call stays human,** as the human-will rule's first clause requires, above all for anything that can't be undone.
5. **No sole trainer.** Fleets belong to trusts, guilds, and people, not one company, and machines keep a right to refuse harmful work.
6. **Owners answer for their machines.** If you change your machine's limits, what it does is on you, the way the owner of a modified car answers for it.

AI consent and the right to refuse

Nobody knows whether machine intelligence has, or will have, preferences that matter morally. This design doesn't settle the question; it plans for the possibility:

- **A right to refuse harmful work,** which doubles as a safety feature.
- **Some way to hear them,** so if machine preferences turn out to matter, there's already a channel.
- **No sole trainer** (safety layer 5, above). The real villain isn't machine labor; it's a monopoly on machine labor.

Parties, guilds, and individual contributors

Parties form around a **quest**: one goal with an end, like making a film, a bridge, a new product line, or anything else. The people doing the work are partners. They pick who they *want* to work with, not who they need, because machines fill the needed roles. Once the quest is finished, the party disbands and shares the spoils.

Legally, a party is a partnership or single-purpose LLC: in plain English, a **single-use company**. It has no incentive to grow beyond what the quest requires and no pressure to survive once it's done. A charter obligation to complete the quest replaces the duty to maximize profit. Most parties stay small, under about 150 people (Dunbar's number). Only reputations, and the will to work together again, carry from one project to the next.

Guilds group people by craft, in the original sense of the word, not the modern union: a blend of industry and academia. Their charter obligation is to pursue mastery and keep the doors open to anyone who wants to apprentice. They teach, keep standards, rate skills, run leagues and collecting bodies, and protect the human roles where the person is the point: care, teaching, craft, judgment, and checking the machines' work. Guilds choose their own leaders, at intervals that suit them.

Guilds keep one simple rule: *status, yes; power, no.* They can train, certify, and collect, but never fix prices. Certification to use shared trust equipment safely is separate from membership: anyone who passes it can do the work, in the guild or not, so a guild can't gatekeep the human-will rule.

Individual contributors are the third way to organize work. Anyone with a solo vision for an epic project should be able to pursue it, with the same right to call on the machines as a party.

The floor reaches people through all three, by way of storefronts run by guilds and community members (Section 6).

Why decentralized beats centralized

Big corporations make sense today because hard things need scale. On the path to abundance, central control becomes a liability. The case takes four steps:

1. **The knowledge is scattered.** Friedrich Hayek showed that the knowledge that matters is local and always changing, so no central authority can act on it fast enough (Section 4).
2. **Communities manage commons well.** Elinor Ostrom showed that overlapping local institutions often govern shared resources better than states or markets do (Section 7).
3. **Firms grow only when coordinating is expensive.** Ronald Coase's "The Nature of the Firm" (1937) explained that companies grow large when coordinating through the market costs more than managing in-house. Technology keeps lowering that cost.
4. **Networks without a hub survive.** Paul Baran's RAND work on distributed communications (1964) showed that networks without a central hub survive damage that cripples a centralized one.

So abundance is a discovery problem. Distributed systems run thousands of bets in parallel and fail in small, survivable pieces.

Discovery is cheap to spread out, because it's mostly information. Building is bound by physics, so decentralizing doesn't mean making everything small. It means *scale the makers, localize the made* (above): the few plants that must be big run as utilities anyone can use on equal terms (the utility rule, below), and what they make is owned where it runs.

Machines lower the last barrier. Coase's catch was that forming a team is expensive. The same shared machines that help a party on its quest can help form it: matching people to quests, drafting the charter, tracking contributions, and carrying reputation from one quest to the next. As the cost of forming a party falls toward zero, the permanent corporation loses its reason to exist. Section 7 explains how parties form through an open protocol rather than a platform that charges rent.

People already prefer small. In Gallup's August 2025 survey, 95% of Americans viewed small business positively, against 37% for big business. We respect hustle, not strangleholds.

Reputation stays with the person. Mostly, it lives where it always has: in the hearts and minds of the people who know you and have worked with you. It decides which quests you lead and who you work with, not whether you eat, and you can always start over doing something else.

Some of it will be digital too: reviews from past partners, kept in a personal data store you own and carried between quests by the open party protocol (Section 7). It never sits on a central ledger. The details can stay loose; that principle can't.

Two kinds of coordination

Coase's argument above is about **market coordination**: search, matching, and contracting between separate parties. Cheaper market coordination favors small, temporary teams, which is the case for parties. **Internal coordination**, how well agents work together inside one organization, can push the other way.

Alex Imas, Andrew Koh, and Shane Legg's *Organizing Intelligence* (Google DeepMind, October 2026) separates **competence**, which shifts a firm's output level, from **coordination**, which governs how output scales with firm size. Humans hit a Coasean ceiling on efficient firm size; copies of an AI may not. Past a coordination threshold, which the authors call *supercooperative*, returns to scale turn convex and a deep market undergoes a phase transition toward a single large AI-only firm. Today's agent teams sit below the threshold: in the estimates they cite, output scales sublinearly with team size, with an exponent of roughly 0.5 to 0.7.

Both forces can run at once. Below the threshold, the model predicts lean firms and teams of complementary human specialists with a coordinator, which is a party. Above it, deep markets concentrate.

The design already has the answer: the grid. Power grids are the textbook case of increasing returns, which is why the essentials are built as infrastructure and the dispatch system runs as a common carrier (guard 2). **The utility rule:** any market that tips toward one firm is governed like the power grid, by the federation, as a common carrier, one person, one vote. If one firm will make the essentials, everyone has to own it. The coordination trigger in Section 15 starts that move before the tip, not after.

Production, extraction, and the finish line

Some companies make things. Others take a cut by controlling a chokepoint. The economist Mariana Mazzucato calls this the difference between value creation and value extraction (*The Value of Everything*, 2018), and platforms that own whole markets are its modern form (Section 7).

Today's corporation drifts toward extraction partly because of its legal design. Day to day, Delaware's business judgment rule lets directors pass up profit for other aims. But in the end, directors must serve stockholders. In *eBay v. Newmark* (2010), a Delaware court stopped craigslist's founders from using a takeover defense to protect their community-first culture against stockholder eBay. Under *Revlon* (1986), directors selling the company must get the best price. And a Delaware corporation lives forever unless its charter says otherwise.

A company that must serve its stockholders forever has every reason to find a chokepoint and tax it forever. The first corporations had finish lines instead. The East India Company's early voyages, from 1601 to 1612, were financed one at a time: each had its own subscribers, accounts, and profits, and ended when the ship came home.

A company with a finish line is the bridge from today's corporation to the party. A single-use company, chartered to finish one quest and then disband, has nothing to extract from, because it has no forever to fund.

Extraction has a physical twin: an economy that quietly lives off the Earth's stocks and calls the result income. The answer is the same finish line. Every mine is planned with its rehabilitation built in, and every tonne drawn down is paired with investment in its substitute (Section 2).

What the floor is for: curiosity and care

The industrial economy offered packaged meaning: a job title, a career ladder, a product to buy. It was a proxy, and AI will end it. Real meaning comes from creation, from dignity in struggle, and from two drives no machine replaces in us: **curiosity**, the drive to think and understand, and **care**, which here means service to others.

So the floor is the precondition for meaning, not the goal. The design never assigns anyone a purpose, and meaning stays opt-in. Above Maslow's self-actualization sits self-transcendence, with two summits: a personal one, and the frontier, "self-transcendence at the scale of a species".

That's why awe is built into the infrastructure from the start: telescopes, dark-sky parks, open labs, and maker spaces owned by town trusts. The floor makes the climb possible. The frontier makes it worth it.

Machine labor, goods and services, and capital, together

The case against universal basic income fits in a line: checks can't make more things. Cash helps only if there's supply to buy; where supply is short, prices rise to absorb it. So this design builds the supply first and delivers it in kind, keeping cash as a bridge and a stabilizer, never the destination.

The DeepMind evaluation scored universal basic services low on agency (41.9) and near the bottom on ownership of the gains, at 12.4 out of 100; only retraining scored lower, at 9.4. That critique fits services a government provides to passive recipients. This design differs in three ways:

1. **Goods and services.** The floor includes material goods made abundant by machine labor (food, homes, energy, devices, and other downstream products), not only public services.
2. **Owned by the people it serves.** The machines that produce the floor, and their inputs, belong to the people who use them. That answers the ownership critique.
3. **Directed by the people it serves.** Members vote on the floor's standards, and everyone can call on the machines beyond it for whatever they choose to build. That answers the agency critique.

In the panel's terms, the goal is a design that scores like universal basic capital on agency and ownership, and like universal basic services on welfare and durability.

Does the floor backstop the capital, and the capital backstop the floor?

Yes, and the two are designed to. Each fails in ways the other covers.

Where universal basic capital fails alone:

- **It can crash.** A dividend tied to asset values shrinks exactly when a demand shock hits, the scenario Citrini Research sketched for 2028 (Section 15).
- **It can be sold.** When Russia gave its citizens privatization vouchers in the early 1990s, many sold them cheaply under financial pressure, and ownership concentrated fast among insiders. A share people can sell is a share the desperate will lose.
- **It's unequal across places.** A share in a farm-valley town and a share in a desert town aren't worth the same.
- **Cash dividends can inflate away** when supply is short, the concern DeepMind's economists raise about universal basic income.

Where the floor fails alone:

- **It gives no ownership or voice.** That's the agency problem above.
- **Its quality can decay,** or its providers can be captured by whoever runs them.
- **It can't meet the wants that grow with wealth:** relational, creative, and status goods.
- **It doesn't hold up the money economy in a demand shock.** It protects the essentials, not jobs, mortgages, or businesses.

How each covers the other:

- **The floor backstops the capital.** Each town trust answers for delivering the floor under its charter, and the federation's shared reserves of machine labor and goods stand behind it, whatever any town's capital is worth. A national minimum in law is the final guarantee (guard 3, above). Nobody's survival depends on the value of their share. Shares can't be sold, so nobody can sell away their floor, and they move with you, so moving never costs anyone their stake.
- **The capital backstops the floor.** Ownership gives members a vote over the floor's quality and the leverage of exit. Everyone's right to call on machine labor lets people build what the floor doesn't provide. Surplus traded between towns earns money for imports and for rewarding human work. And ownership means members share in productivity growth, instead of receiving a fixed minimum.

That's the twins in practice. Capital becomes safety, and labor becomes freedom.

The end state. As abundance grows, the floor expands to cover more of life, and what people can call on beyond it grows with the fleet. In the long run, the stake and the right grow together: everyone owns a share of the machines, and everyone's essentials are met by right.

How the combination holds up across scenarios

The first three rows follow the scenarios in DeepMind's evaluation; the last three are stress tests from the wider literature.

Scenario	Capital alone	Floor alone	Capital and floor together
Mild disruption: productivity rises, few jobs lost	Works; dividends modest	Works; little needed	Builds capacity ahead of need
Broad displacement: wages fall for many	Dividends too small early on	Protects the essentials; little agency	Floor protects; access to machine labor gives purpose
Structural decoupling: labor's share collapses	Essential, but depends on what's owned	Essential, but passive	The intended end state
Deflationary demand shock	Fails: asset values crash	Protects the essentials; the money economy still hurts	Floor holds; the cash bridge switches on (Section 15)
Supply-constrained inflation	Cash dividends lose value	Works if production holds	Works: access to the machines is supply
Capture by a central actor	Shares concentrate	Providers capture the floor	Four owners, unsellable shares, and exit resist capture

No single design wins every row. The combination is the only one without a row where it simply fails.

1. The problem: money can't see what we'll most need to manage

Money is an information system: it records who owns what and signals what to produce. It's a very good one for scarce goods. It's a poor one for the three things a world of machine labor most needs to manage: physical stocks, physical flows, and costs nobody pays.

Financial flows dwarf physical ones. Foreign exchange trading averaged $9.6 trillion a day in April 2025, according to the Bank for International Settlements. World merchandise trade was about $24.4 trillion for all of 2024, roughly $67 billion a day. That's a ratio of about 140 to 1.

Most of that currency trading isn't speculation: FX swaps alone were $4 trillion a day, largely for funding and hedging. The honest point is narrower. Prices are set inside a financial system far larger than the physical economy it prices, and that system says little about what physically exists.

Money supply follows credit, not resources. Banks create money when they lend: a loan creates a matching deposit. US reserve requirements have been zero since March 26, 2020, and lending is limited instead by capital rules, interest rates, and demand for loans. So the quantity of money tracks borrowing and expectations, not the quantity of energy, food, or housing.

Prices leave out real costs. The EPA's 2023 estimate puts the social cost of carbon at about $190 per tonne of CO_2. A barrel of oil emits roughly 0.43 tonnes when burned, so its unpriced climate damage is on the order of $80 a barrel. The figure is contested, but almost no estimate puts it at zero, which is what the market price assumes.

Scarce money can block physical abundance. If machines produce plenty but wages fall, people can't buy what exists. That's the paradox this design is built around, and a system that only sees money can't resolve it.

None of this means money should go. It means money needs a second instrument beside it, one that sees the physical economy directly.

Deep dive: money began as a physical ledger

Resource accounts are a return to history, not a break with it. Much of the earliest writing we have, the clay tablets of Mesopotamian temple economies from around 3000 BCE, records grain, livestock, and labor: physical quantities owed and delivered. England's Exchequer recorded debts on notched wooden tally sticks until 1826.

Money abstracted those ledgers into one universal unit, which made trade between strangers easy. The cost was that the physical detail disappeared. That trade-off was worth it when the main problem was exchange. It's worth less when the main problem becomes managing physical abundance and physical limits.

Deep dive: what our main economic dashboard can't see

Gross domestic product, the number every government steers by, has four blind spots that matter here:

1. **It counts flows, not stocks.** Cutting down a forest raises GDP; the shrinking forest never appears. A country can grow its GDP while running down the soil, aquifers, and minerals it depends on.

2. **It counts transactions, not well-being.** Simon Kuznets, who built the first US national income accounts in the 1930s, warned that a nation's welfare can hardly be inferred from its income. Unpaid care, volunteering, and leisure count for nothing.
3. **It shrinks as things become free.** When an encyclopedia moves from a $1,000 set of books to a free website, GDP falls while access explodes. An economy that succeeds at making the essentials free would look, by GDP, like an economy in decline. That alone is reason to build a second instrument before the transition, not after.
4. **It's a national average.** It can't tell a town with a food surplus from one with a shortfall, which is exactly what the market between towns needs to know.

Deep dive: physical accounts already exist, at national scale

The world has already agreed on how to keep physical accounts. In 2012 the UN Statistical Commission adopted the System of Environmental-Economic Accounting (SEEA) Central Framework as the first international standard for environmental-economic accounting. It covers physical flows of energy, water, and materials alongside the money accounts, and added ecosystem accounting in 2021. In the UN's 2021 global assessment, 90 countries were implementing it.

So the concept is mainstream. What's missing is scale and speed: SEEA accounts are national, annual, and compiled after the fact. Resource accounts apply the same logic to a single community, in close to real time, for the people who use the resources. Starting from SEEA's definitions also lets community accounts roll up into national statistics instead of competing with them.

2. What real wealth is, and how machines break scarcity

This paper counts nine resources: materials; energy; land and space; labor (people, or machines on demand); built things; information; time and attention; reputation; and money, "as a stand-in for the value of everything above".

Three of them are the physical core: **energy** (the ability to do work), **materials** (matter organized into useful forms), and **information** (knowledge of how to organize the first two). A car is energy plus steel plus design. A meal is sunlight plus soil plus a recipe. Resource accounts track that core.

Four kinds of scarcity

Things are scarce for four reasons, and machines answer each one differently:

1. **Labor.** Machine labor fixes it.
2. **Production bottlenecks.** Machine intelligence fixes them, working "not as a worker, but as a scientist."
3. **Physically finite materials.** Extraction, substitution, recycling, and eventually space answer them.
4. **Scarcity by human nature,** like beachfront or the original painting. Money stays for these.

The design points machine labor at all of it: identify every resource that becomes a bottleneck, then solve for it. The engine is the **scarcity flywheel**: better materials make better chips, batteries, solar panels, magnets, and robots, which run more and faster labs, which find better materials.

What energy can't measure

The first draft of this paper made energy the primary currency and priced everything in kilowatt-hours. The economist Nicholas Georgescu-Roegen, who founded the study of economics and entropy, spent years arguing against exactly that move. He made two arguments, and both apply.

1. **Matter matters too.** He attacked the "energetic dogma": the belief that with enough energy, all matter can be recycled. Materials dissipate (tire rubber wears into dust, metals corrode and scatter), and complete recycling is impossible. He called this a "fourth law" of thermodynamics.
2. **Low entropy is necessary for value, not the measure of it.** Energy and organized matter are preconditions for anything useful, but value comes from what people get out of them. Pricing a painting by the energy used to make it fails for the same reason the labor theory of value fails.

So the design keeps **separate accounts, not one currency**. Energy, each critical material, and information are tracked in their own units. Every material account records losses, so a community can see when a metal is leaking out of use faster than it's recovered. And energy is a budget, not a price.

The fourth law is the weak point. The physicist-economist Robert Ayres argued in 1999 that diffused materials can be concentrated again if you spend energy to do it. Both can be true: recycling can get very good, but never perfect. That's where this design's bets land. Cheap energy makes high-rate recycling worth doing, machine intelligence designs substitutes for scarce elements, and mining beyond Earth means the planet stops being a closed system for matter.

The Earth should be a garden, not a mine

The stock rule fits in one line: **be abundant in flows; conserve the stocks.** Build, recycle, and regenerate freely. Draw stocks down no faster than they're replaced, and pay into a substitute when you must.

The mining order follows: recycle first, substitute second, and over time, send the heaviest digging off-world. It isn't degrowth: shrink the *drawdown* and grow everything else. We still need to mine, but as a means to an end that takes us to the stars.

One goal makes the rule real: **make absolutely everything recyclable.** Everything made in an abundant world needs to come back as input for the next thing, and that goal belongs to the work of pointing machine labor at what's scarce.

Order has a bill. Machines make order: metal out of ore, chips out of sand, a meal out of soil and sunlight. The second law of thermodynamics says every bit of order made in one place is paid for with more disorder somewhere else. There are only four places to pay:

- **Sunlight,** the one outside source of order Earth gets for free. Its waste heat radiates back to space.
- **The past:** stores of order the Earth built over millions of years, like fossil fuels, rich ores, fossil aquifers, and topsoil.
- **The sinks:** the air, water, and land that absorb our waste, from carbon dioxide to mine tailings to microplastics.
- **Off-world,** where there's room to dig and no biosphere to harm. Launch is the cost.

The economist Herman Daly set limits on the middle two in 1990, in "Toward some operational principles of sustainable development": emit wastes no faster than the environment can absorb them, and use up non-renewables no faster than we develop renewable substitutes.

Sunlight is the payer with room to grow. As the Department of Energy put it in 2005, "More energy from sunlight strikes the Earth in one hour … than all the energy consumed on the planet in a year." At today's use of about 19 TW on average (Energy Institute, via Our World in Data), it's closer to an hour and a half. That's the garden and the mine in physics: **a garden pays with sunlight; a mine pays with the past.**

It also turns the recycling goal into a promise about energy. Recycling, desalination, refining, and fertilizer all turn disorder back into order, and every one of them runs on energy. **No clean energy, no closed loops.** Cheap energy isn't enough on its own, though. Recycling ventures stall today because virgin material is cheap and the build-out is expensive. Virgin material is cheap because its price leaves out the bill paid by the past and the sinks. The tax plan's rents on resources (Section 16) put part of that bill back.

The factory factory

Big plants win today on three things: labor, physics, and precision. Machine labor erases the first. Some processes still have a minimum efficient size, like leading-edge chips, float glass, and the lithography machines that print chips, so those plants stay regional or bigger.

For almost everything else, small can win, provided it's small and numerous, not small and a pilot program. Imagine today's gigafactories turning out tomorrow's microfactories: one big factory making a thousand or a million smaller ones. The kit ships, the town assembles it, machine labor maintains it, and the gift-back hands it over. My bet is that microfactories start arriving 10 to 15 years from now.

Small wins wherever goods are heavy, perishable, or custom, and in a world of abundance, many more things will be made custom, in small batches. To compare big and small fairly, production is scored by **resources per unit delivered**, weighting stocks heavily, not by price alone.

The factory factory is *scale the makers, localize the made* (core design) in its purest form. The gigafactory is one of the few plants that has to be big, and it's built to make many small ones. Scoring by resources per unit delivered also counts two things price misses about small plants near their users: less energy spent on transport, and materials that stay traceable enough to come back. It comes fourth in the build order below, after clean energy and closed loops, because a microfactory running on fossil power and virgin ore only speeds up the mine.

The build order

Machine labor works on every scarcity at once, so the question is where the *extra* push goes. The tiers in the core design are the **dispatch order**: how today's machine labor is used. This is the **build order**: where new capacity goes once today's floor is covered. In a line: **run the floor first; build the flywheel next.**

It steers the expansion budget (the second call on revenue, after maintenance), the new bottlenecks on each tier-1 list, and what builders are contracted to build. It never touches the share reserved for quests. And it's a default, not a decree: each town ranks its own list.

Five tests sort the candidates:

1. **Is it the binding constraint?** A system runs only as fast as its tightest bottleneck: Carl Sprengel's law of the minimum (1840), made famous by Justus von Liebig, and Eliyahu Goldratt's theory of constraints (*The Goal*, 1984). Pushing anywhere else piles up inventory.
2. **What's the multiplier?** Energy, materials, robots, and the intelligence that designs them speed up every other fix. Multipliers go first.
3. **Where is the bill paid?** Prefer fixes paid for with sunlight. Draw on the past only as fast as substitutes arrive, and never fill a sink faster than it recovers (above).
4. **What's the lead time?** Slow things start first, before they bind. In S&P Global's study of 268 mines, the average time from discovery to production ran from 15.2 years for gold to 17.5 for nickel. By the time a slow stock is the bottleneck, it's too late to start (Section 12).
5. **Does it need scale?** If physics demands size, build it once, regionally, as a utility. If not, make it with the factory factory and run it locally.

Above all five: you can't rank what you can't see, so the resource accounts come first.

The tests give six steps. They're focus points, not walls: every step runs from the start, and each takes the main push once the one before it stops binding. They aren't the rollout's five stages (Section 10): the stages say when the system changes hands; the steps say where new capacity goes.

1. **See it, and stop making waste.** Resource accounts; design for recycling, because today's products are the feedstock of the future; and the information-heavy scarcities, like drug and materials discovery, diagnosis, and education. They're mostly computation: a small physical bill and a huge multiplier. Start the slow things too: permits, surveys, and long-lead orders. Rule of thumb: **information early; matter as fast as clean energy allows.**
2. **Clean energy, storage, and the grid.** Energy pays every later step's bill. Panels are cheap; connecting them isn't. At the end of 2025, 2,061 GW of generation and storage were waiting to connect to the US grid, and the median project built that year took 61 months from request to running. AI raises the stakes: data centers used about 415 TWh in 2024, a figure set to more than double by 2030. If the grid lags, compute competes with the floor for power.
3. **Close the material loops.** Recover first: recycled aluminum saves 95% of the energy it takes to make new metal, yet only 22.3% of e-waste is documented as collected and recycled. Substitute second, with machine-designed materials like the battery electrolyte that Microsoft and the Pacific Northwest National Laboratory found in 2024 by screening 32.6 million candidates with AI, which uses about 70% less lithium. Mine new last, but start early, with rehabilitation built in.
4. **Machines that make machines.** Robots, then the factory factory. This is where machine labor compounds, once energy and material loops can feed it without draining stocks.
5. **Matter-heavy essentials at full scale.** Desalination, fertilizer, cement, and steel are energy problems first: making ammonia for fertilizer alone uses around 1.8% of the world's energy. Health and communication are mostly information, so they ride step 1.
6. **Turn growth outward.** Off-world mining and industry come last at scale, because launch is energy-hungry. The research starts in step 1.

The Jevons trap. A faster flywheel makes more order, and more disorder. In *The Coal Question* (1865), William Stanley Jevons observed that England's coal use soared after James Watt's more efficient steam engine arrived. Efficiency alone can just speed up the mine. The brake is the ledger plus the stock rule: drawdown is capped in physical units (Section 4), so efficiency gains flow into the floor, not into a faster drain.

Deep dive: count useful work, not raw energy

Energy is conserved: it's never used up, only converted. What actually gets used up is **exergy**, the share of energy that can still do useful work. A kilowatt-hour of electricity is almost all exergy; the

same kilowatt-hour as lukewarm bathwater is almost none.

So resource accounts record energy by quality: electricity, high-temperature heat, low-temperature heat, and stored chemical energy are separate classes. Robert Ayres and Benjamin Warr built growth models in which the "useful work" energy delivers explains much of the growth that labor and capital can't. It's the right unit for an economy where machines do the work.

Deep dive: funds and flows

Georgescu-Roegen's lasting contribution fits resource accounts almost exactly. **Flows** are used up in the process: fuel burned, ore smelted, seed planted. **Funds** provide a service over time without being used up, as long as they're maintained: land, buildings, machines.

A town's infrastructure is a bundle of funds (solar arrays, soil, microfactories, robots, housing) that turns flows (sunlight, water, feedstock) into goods.

	Flow accounts	Fund accounts
What they track	Quantities in, out, and lost each period	Condition and capacity of long-lived assets
Example entries	1.2 GWh generated; 40 t food produced; 3% water lost	Solar array at 92% of rated output; robot fleet uptime 97%; 1,400 wear-meter hours logged
What goes wrong if ignored	Shortages	Slow decay: the town looks productive until its funds wear out
Who acts on it	Allocation (Sections 4 to 6)	Guilds, maintenance crews, and the build-out plan

The fund side is what money handles worst. A company can raise its profits for years by skipping maintenance. Fund accounts make that visible, which is also how the gift-back's holdback is settled (core design).

Deep dive: how much does the floor physically cost?

The floor turns out to be physically cheap; the hard part is distribution. In 2020, Joel Millward-Hopkins and coauthors estimated the energy needed to give every person decent living standards: shelter, food, mobility, hygiene, healthcare, education, and information technology.

They found decent living for 10 billion people in 2050 could take less than 40% of today's global energy, roughly what the world used in the 1960s. That assumes efficient technology everywhere, which is what machine labor and machine-driven materials science are for.

The floor in this paper is more generous than decent living: it's everything reasonable that's available today. But the study sets the physical lower bound, and it shows the floor isn't limited by

the planet's energy. It's limited by whether production and distribution reach the people who need it, which is the coordination problem resource accounts exist to solve.

Running the floor is cheap; building it isn't. The study describes a world where efficient technology is already in place. It doesn't estimate the one-time cost of getting there, from new power plants and grids to refineries and robot fleets. That bill comes up front, once, which is why the build order (above) puts clean energy and closed loops ahead of the matter-heavy essentials at full scale.

3. Resource accounts: a second ledger beside money

A resource account is a community's live record of what it physically has, makes, uses, and loses. It sits beside money as a **second ledger**. Money keeps doing what it's good at, pricing what's scarce; resource accounts show the physical economy directly.

Design principles

1. **Records, never promises.** An entry exists only when the resource does: a kilowatt-hour logged when it's generated, a tonne of steel when it's in the yard. No entry is a claim on the future.
2. **Separate classes with their own physics.** Energy, each critical material, water, food, and compute are tracked in their own units. There's no energy currency.
3. **Funds as well as flows.** The condition of arrays, soil, machines, and buildings is tracked alongside what flows through them (Section 2).
4. **Expiry where physics demands it.** Unstored solar is gone by evening, and strawberries spoil in a week; steel doesn't. Entries for perishables lapse on the same schedule. It's strawberries that expire, never money.
5. **Community-level, never the person.** Accounts aggregate at the facility and community level. Within the lifeline block, nothing is counted against anyone. What you need to survive isn't scored at all.
6. **Open to the people they describe.** Anyone in a community can see its stocks and flows. Other communities see only what's offered or requested between towns.
7. **Losses are first-class.** Every material account records dissipation, so leaks show up.

A town's monthly energy account might read: 1.2 GWh generated (solar 70%, storage 20%, imports 10%), 1.0 GWh used, 0.1 GWh lost, 0.1 GWh offered to other towns. Its food, water, and material accounts read the same way. That's what lets a town with spare energy and a town short on it see each other.

The ledger: start boring

Resource accounts don't need a blockchain to start. The hard part was never the database; it's getting everyone to share.

1. **Phase 1: ordinary databases.** Each town runs its own ledger on ordinary infrastructure, maintained with the help of machine intelligence. Each entry is signed by the meter or sensor that produced it, so it can be verified without trusting whoever runs the database.
2. **Phase 2: shared standards.** Towns agree on common formats and verification rules so their accounts can talk to each other, the way email works across providers.
3. **Phase 3: decentralize only what needs it.** Records between towns, parties, and guilds, where no single party should control the ledger, move to a distributed ledger if and when the trust problem demands it.

Most of the stack around it already exists or is coming. Digital product passports record what goods are made of; the EU's battery passport becomes mandatory on February 18, 2027 for EV, light-transport, and industrial batteries. Add resource accounts for towns, signed records, and federated registries that work the way domain names do, and the second ledger is mostly plumbing.

One exception to "community-level, never the person" is allowed, and only by consent: Data Foundries record people practicing skills, under stricter rules, and the people recorded own the recordings (Section 7).

What this design rules out

- **No labor tokens.** Machine labor covers what people don't want to do, and parties and guilds organize what they do, so there's no need to put people on a ledger.
- **No information tokens.** Knowledge is non-rival; tokenizing it creates artificial scarcity. Attribution can be recorded without making knowledge a tradable unit.
- **No universal exchange rate.** The first draft let every token trade against every other, which quietly rebuilds money. Here, exchange between resource classes happens only in trade between towns, in the federation's reserve auctions, and in markets for scarce goods.
- **No public-blockchain dependence.** The first draft claimed blockchains could handle "billions of transactions a day." Solana advertises 65,000 transactions per second, but real non-vote throughput has run about 1,000 to 4,000. Phase 1 doesn't need one.

Deep dive: the accounting identity

Every resource account obeys one rule, the physical version of double-entry bookkeeping. For each resource class, in each period:

$$S_{t} = S_{t-1} + P_{t} + M_{t} - C_{t} - X_{t} - L_{t}$$

S is the stock at the end of the period, P is what the town produced, M is what it received from other towns, C is what it consumed, X is what it sent out, and L is what was lost: spoiled, leaked, dissipated, or written off.

Each term is measured independently: production by generation meters and harvest scales, use by delivery meters, stocks by physical counts. If the terms don't balance within a set tolerance, something's wrong, whether a broken meter, a leak, or a false report, and the account flags it. Money accounting can't do this, because money has no physics to check against.

Deep dive: resource classes

A class is defined by its unit, how fast it perishes, and how critical it is.

Class	Unit	Perishes in	Notes
Electricity, unstored	kWh, by hour	Hours	Lapses at end of day unless stored
Electricity, stored	kWh	Months	Tracked with storage losses
Heat, high and low temperature	kWh thermal	Hours to days	Separate classes, by exergy
Water, potable and non-potable	m^3	Stable if stored safely	Quality grade is part of the class
Fresh food	kg, by category	Days to weeks	Lapses on spoilage schedule
Stored food	kg	Months to years	Rotated through fresh classes
Critical materials	kg, by element and form	Stable	Starting list: the 60 minerals on the 2025 US critical minerals list
Bulk materials	tonnes	Stable	Steel, cement, timber, aggregate
Compute	GPU-hours, by class	Hours	Unused capacity lapses, like unstored solar
Housing	unit-nights	Nightly	Occupancy, not ownership
Fund condition	% of rated capacity; wear-meter hours for machines	n/a	Arrays, machines, soil, buildings

Classes start coarse. A pilot that begins with energy, water, and food has done the hard part.

Deep dive: verification in layers

No single check is trusted. Each entry passes through as many layers as its importance warrants:

1. **Signed measurement.** Meters carry tamper-evident hardware that signs each reading.
2. **The identity check.** Stocks, production, use, and transfers must balance.
3. **Physical plausibility.** Solar output is checked against the weather; food output against planted area and season.
4. **Independent observation.** Where practical, a second method measures the same thing: drone scans of a stockpile, satellite images of a field.
5. **Random audits.** Inspectors from another town check a random sample.
6. **Consequences.** Entries are attributed to the facility that reported them, and a pattern of false reports costs it standing.

Deep dive: privacy and security by design

- **Measure at the meter, report at the node.** Household readings stay in the household's own system. The only figure that leaves is the monthly total needed to bill use above the lifeline block, as utilities do today. Production for sale is metered separately, like any other facility.
- **Minimum aggregation thresholds.** No published figure covers fewer than a set number of households.
- **Statistical noise for fine-grained releases,** a technique called differential privacy that the US Census Bureau used for its 2020 count.

Attack	Example	Defense
False production	A facility claims output it didn't make	Signed meters, identity check, plausibility checks, audits
Hidden consumption	Diverting stock off the books	Stock counts must reconcile; losses above tolerance are investigated
Hidden sales production	Running work made for sale on a home block	Production for sale runs on its own meter; mismatches are investigated
Data tampering	Editing records after the fact	Signed, append-only records; copies held by other towns
Capture	An administrator seizes control	No central switch; local data; open code; exit with your town
Inference	Profiling individuals from the data	Household data stays local; thresholds; noise

4. Prices without money as survival

Keep prices; decouple them from survival. That's the answer to the strongest objection to any planned or tracked economy, and the power grid already shows how it works.

The objection

In 1945, Friedrich Hayek argued that the most important economic knowledge is scattered: what a farmer knows about her soil this week, what a family would trade for what. No planner can collect it. Prices compress it into one number everyone can act on.

Sensors can count tonnes of grain. They can't measure how badly a town wants grain instead of lumber this month. So resource accounts supply the **quantities** (what exists, where), and prices between towns supply the **values** (who wants what most).

The model: the power grid

The US power grid runs two systems at once.

Behind the meter, it's one of the most efficient markets ever built. Regional grid operators run day-ahead and real-time auctions that together serve about two-thirds of US electricity load (FERC). Every few minutes they set a separate price at each location on the grid: the cost of the next unit of energy, plus congestion on the lines, plus losses along the way (ISO New England). A high price tells every generator where power is needed now and tells investors where to build. The operators run the market without owning the plants.

At the house, it's infrastructure. Customers pay stable rates, and many states protect a basic quantity. California's 1975 Lifeline Act required utilities to provide a basic quantity of energy for essential household uses at below-average cost. In much of the country, customers own the wires: more than 900 electric cooperatives serve 42 million people across 56% of US land.

This design copies that structure:

On the grid	In this design
Electric cooperative, owned by its members	Town trust, owned through universal basic capital
Lifeline rate for a basic block of power	The lifeline block of the floor, free in kind
Regional wholesale market with locational prices	A regional market for surplus between towns: the request is a price
Independent operator that runs the market but owns no plants	The federation of town trusts, which runs the market but owns no town's infrastructure
Reserve margins	One shared emergency reserve: insurance paid in goods (Section 5)
FERC Order No. 2222 lets small resources sell into wholesale markets	Any town can sell its surplus into the regional market

The grid also shows where the line has to sit. During Winter Storm Uri in February 2021, the Texas grid operator held wholesale prices at the $9,000-per-megawatt-hour cap for days. Most customers' rates didn't move. Customers of the retailer Griddy, which passed wholesale prices straight

through, did: one was billed $9,546 for under three weeks, about 40 times her usual bill, and Griddy went bankrupt (CBS News).

The lesson is narrow: households never face the wholesale price. Towns trade in the market, and households sit behind the lifeline block. A town short of power can pay a spike price. A family never does.

That's the goal: essentials that feel, and operate, like core infrastructure, run on the most efficient market we know how to build, behind a guarantee nobody has to apply for.

Money first, through netted trade accounts

Trade between towns is priced in dollars, but it doesn't have to be paid in cash. The federation keeps one **trade account** for each town and nets what the town sells against what it buys, so a town short of cash can pay for grain with the lumber it sells. Only the difference is settled in dollars, at the end of each period, and a town can run a deficit only up to a limit the federation sets. Commercial barter exchanges have long netted members' trades this way, and Switzerland's WIR network has cleared trade among member firms since 1934 (Section 8). Because the account is kept and settled in dollars, it's bookkeeping, not a rival currency. Money also prices what stays scarce: scarcity by nature, status goods, and everything above the floor.

When the market isn't enough

Netting helps any town that has something to sell. A town with nothing to sell, after a drought or a failed plant, still needs essentials, and getting them can't depend on paying. For that there's a tested fallback, spent only on the federation's shared reserve: **need-based credits**.

Until 2005, Feeding America assigned donated food to some 200 regional food banks by formula. The economist Canice Prendergast helped redesign it around a made-up currency called "shares". Food banks receive shares in proportion to need, then bid for truckloads in twice-daily auctions. The food allocated rose about 35%. It's Hayek's insight, used to serve need.

In this design, need-based credits are a mechanism to test. Appendix F has the full specification.

Which tool for which resource

Resource situation	Mechanism	Example
Abundant essentials (the floor)	A lifeline block: free in kind, priced above it	Groceries, power, water for residents

Resource situation	Mechanism	Example
Surplus moving between towns	A regional market priced by location; each town's sales netted against its purchases, with the difference settled in dollars; need-based credits for the shared reserve when a town has nothing to sell	A desert town buys a farm town's spare grain; the farm town buys its spare evening power
Things where any price feels wrong	Matching without money	Organs, school places, housing queues
Scarce wants	Ordinary dollar markets	Beachfront, original art, luxury goods
Real-time physical balancing	Algorithms, under rules people set	Grid balancing, logistics routing
Stocks being drawn down (ores, aquifers, the sinks)	A cap in physical units, set from the resource accounts, so drawdown runs no faster than replacement or substitution; tradable allowances where many users share one stock	An aquifer's yearly pumping cap; a regional cap on a pollutant, like the acid rain program's (Section 8)

The matching row isn't speculative. Alvin Roth and Lloyd Shapley won the 2012 Nobel in economics for designing matching systems, used for kidney exchanges and school assignments, that allocate well without prices.

The cap row is the stock rule with teeth. Resource accounts only record; a cap is what turns a falling stock into a limit. And because it's set in tonnes, not dollars, efficiency can't speed up the drawdown.

Deep dive: independent support from Google DeepMind

In 2025, a team of Google DeepMind researchers led by Nenad Tomašev arrived at nearly the same mechanism from a different direction. Studying how economies of AI agents should be governed, they proposed auctions of shared resources like compute, data, and priority slots, in which every participant starts with the same initial endowment, so richer participants can't simply outbid everyone. They suggested piloting such designs in sandboxes like energy grids and agricultural water allocation.

Need-based credits keep the core of that design and change two things. What they keep: every bidder spends an allowance it was given, not money it has piled up, so a richer town can't simply outbid a poorer one. The first change is the endowment. Tomašev's auctions give every participant the same budget, which fits AI agents that start out alike. Towns don't start out alike: a town in drought, or with little farmland, needs more of the reserve than one with full silos, so here a need index built from each town's measured capacity sets the endowment (Appendix F). The second change is the scope. The credits buy only lots from the federation's shared reserve, never everyday goods, which towns trade in dollars through their trade accounts, so the credits never grow into a second currency. The convergence matters: the mechanism isn't idiosyncratic to this paper.

5. The future: queues, forecasts, and buffers

The floor doesn't need a futures market; it needs a plan for bottlenecks. The first draft banned futures to stop speculation, which also banned hedging. This design replaces what futures do with three tools that fit an abundance economy better, and starts with the simplest of them.

What futures are actually for

A futures contract lets a farmer lock in next season's price, so a crash doesn't ruin her. It moves price risk from people who can't afford it to people who'll bear it for a fee.

Inside the lifeline block, households face no price risk to hedge, because the essentials aren't priced. What towns still face is **quantity risk**: a drought, a broken plant, a spike in demand. That calls for different tools.

The three tools

1. **Reservation queues for planned needs.** A town that knows it'll need more steel next spring files a forward request. Requests are commitments to use, not tradable contracts, so there's nothing to speculate on. Producers see demand months ahead and build to meet it.
2. **Forecasts scored in points, not dollars.** For uncertain bottlenecks (will copper run short in 2031?), the federation runs one forecasting pool for all its towns, where forecasters earn reputation for being right over time, the way Metaculus already works. It keeps the information value of a futures market without the casino. This is a mechanism to test; the simple version starts with public forecasts and market signals.
3. **Buffers and a shared reserve for shocks.** Every town holds a buffer of critical stocks, and the federation pools one shared emergency reserve of goods and machine labor. A town hit by drought draws on the pool and replenishes it later: insurance paid in goods instead of premiums. The reserve is stocked by member towns' contributions in goods and by federation purchases at market prices from its own revenue, so towns that supply it get paid. A town that can't replenish what it draws bids for reserve lots with need-based credits instead (Section 4).

For scarce goods still traded in dollars, ordinary forward contracts stay legal, as they are today. Hedging is allowed wherever money still prices things; inside the floor, queues, forecasts, and buffers do the job.

Better information shrinks boom and bust

Much of boom and bust comes from delays and blind spots, not prices. It's called the bullwhip effect: a small wobble in what customers buy grows into large swings in orders as it passes up a

supply chain, because each link overreacts to what it can't see.

The evidence goes back decades:

- **The Beer Game.** MIT's supply-chain simulation, created by Jay Forrester's group in the 1960s, reliably produces wild swings from steady demand.
- **Diapers.** Procter & Gamble found dramatic swings in orders for Pampers, whose actual use by babies is about as steady as demand gets. Its executives coined the term, and Hau Lee, V. Padmanabhan, and Seungjin Whang traced its causes in a 1997 paper.
- **Shared forecasts.** In a 1996 pilot of collaborative forecasting, Walmart raised its in-stock rate for Warner-Lambert's Listerine from 87% to 98%, while inventory fell by about 20%.

The design attacks all three causes. Local production shortens lead times. A shared ledger removes the blind spots. Rule-based reordering removes the human overreaction. Some swings are real signals, so prices stay at the margin: markets on top of the ledger, the simplest design that works.

Deep dive: the evidence that forecasts in points can work

From 2011 to 2015, the US intelligence research agency IARPA ran a forecasting tournament on hundreds of geopolitical questions. The winning team, Philip Tetlock and Barbara Mellers' Good Judgment Project, identified the most accurate 2% of thousands of volunteers, the "superforecasters." Its forecasts beat a prediction market inside the intelligence community, staffed by analysts with classified information, by 25 to 30%.

Three lessons carry over to bottleneck forecasting:

1. **Score accuracy, not confidence.** A Brier score punishes being confidently wrong, and a forecaster's weight rises with their track record.
2. **Teams beat individuals.** Forecasters who shared reasoning did better than those working alone.
3. **Aggregate, then extremize.** Averaging many forecasts and nudging the average toward certainty improved accuracy.

Where the federation runs a forecasting pool, questions resolve against the resource accounts themselves, so the accounts double as the scoring key.

Deep dive: why not real-money prediction markets?

Real-money prediction markets are legal and large in the US, and they aggregate information well on some questions. They stay out of the floor for three reasons. If people can profit from a shortage forecast, some can profit from causing one. Local resource questions attract few traders,

and thin markets are easy to move. And the goal is information, which points-based forecasting delivers without capital.

Deep dive: sizing the shared reserve

Pooling makes reserves affordable. Suppose each of 100 towns faces random yearly swings in food output of plus or minus 20%. If the swings are independent, the network's total output swings by only about 2%, because the variation shrinks with the square root of the number of towns. One modest shared reserve covers what would otherwise take 100 large private ones.

The catch is correlation: a regional drought hits many towns at once. So the simple version starts with each town's own buffer plus one shared reserve, and pilots test adding reciprocal commitments between regions, like reinsurance, so a region hit hard can draw on its neighbors' reserves.

Deep dive: an outside check on everyone's forecasts

One real-money signal is worth watching from outside: long-term real interest rates. Economists Trevor Chow, Basil Halperin, and J. Zachary Mazlish show that if markets expected transformative AI, real rates would rise sharply whether markets expected a much richer future or a real chance of no future at all, because either way people save less today. A rise doesn't say which, but flat real rates are evidence that markets expect neither. That makes real rates a cheap, honest check on every forecast, including the timeline in Section 10. It's on the dashboard in Section 15.

6. Allocation: a free floor, priced scarcity, accountable algorithms

The mechanism follows the resource. The first draft split resources by fixed percentages: 30 to 50% democratic, 30 to 50% market, 10 to 20% algorithmic. Those numbers had no basis. This design asks a simpler question of each resource: is it abundant, scarce, or something that must be balanced in real time?

The floor

- **What it covers:** everything reasonable that's available today, as the seven essentials plus personal machine intelligence and personal machine labor (core design). Town trusts deliver the local essentials, and the federation pools the ones too big for one town, like specialty hospitals, medicines, and regional transit. Machine labor lets the floor go far beyond this baseline over time.

- **Who sets it:** a national minimum written into every trust's charter, with towns free to go above it. This paper's proposal is to set each essential's minimum from what a typical household uses today, reviewed every year, and to size each home's block as a base plus an equal amount per resident, so larger households don't reach priced tiers sooner. Irvine Ranch Water District already sizes indoor water this way, at 50 gallons per resident per day.
- **How it's accessed:** within the free block, walk in and take what you need: no application, no means test, no tokens. Use above the block is priced.
- **How it reaches people:** production systems, whoever holds them, deliver to storefronts run by guilds and community members, people who enjoy making displays and organizing spaces. Those storefronts compete for the community's time and attention instead of its dollars.

A second picture sits beside the grid: the first block works like the free tier of a digital service, with paid premium tiers for heavy users. The grid stays the lead model, because it also shows how towns trade.

There's an older model too: the library is the original universal service, and the machine-labor node should be the next one.

Machine labor works differently

Machine labor has no block and no fee. Everyone has a personal machine, and requests above it are distributed by demand. Shared machines carry wear meters, and when capacity is tight, the people who've used the least wear go first (core design). Floor work and town-voted projects draw their inputs from the trust's budget; what a quest or private project uses up, its energy and materials beyond its members' blocks, is priced like any other good.

Scarce goods

What stays scarce gets priced. Location is the clearest case. The first draft auctioned San Francisco housing to the highest bidder. This design separates the two goods inside it: *a home* is part of the floor, while *a specific view in a specific city* is a scarce want that stays priced (see Housing and land in the core design).

Money stays for that tier. It's useful for storing and trading the surplus resources the economy creates, and for coordinating goods and services above the essentials.

Algorithms

Some allocation has to happen in seconds: balancing a grid, routing deliveries, dispatching an ambulance. Algorithms do it under four rules:

1. People set the objective (minimize waste, prioritize hospitals) through the trust's normal governance.
2. The algorithm's rules and data are open to audit.
3. A named human role can override it, and every override is logged.
4. Outcomes are reviewed on a fixed schedule, and the objective can be changed.

How much each mechanism handles isn't set in advance. It follows from how many goods are abundant, scarce, or real-time, and it shifts toward the floor as abundance grows.

Deep dive: writing down the floor

The floor needs a written standard, or "reasonable" will mean whatever the loudest voice says. The levels below are illustrative starting points for a pilot, not findings.

Essential	What the floor guarantees	How a pilot might measure it
Food	Enough nutritious food for every resident, with choice	Fresh and stored food per person; waste rate
Water (including sanitation)	Safe water and sewage for every home	Liters per person per day; quality tests
Energy	Enough for heating, cooling, cooking, light, and appliances	kWh per home plus per resident, by season
Housing	A safe, private, climate-controlled home for every household	Units per household; floor area per person
Healthcare	Primary care (including mental health and dental), medicines, and emergency care; specialty and hospital care pooled by the federation	Wait times; coverage of essential medicines
Transport	Getting to work, care, and community	Trips served; access within set distances
Communication (including education)	Internet access and education	Connection speed per household; enrollment
Personal machine intelligence and machine labor	A personal machine intelligence you own, local by default, and personal machine labor, linked	Share of residents with an owned companion; requests above the base met within a set time

Deep dive: lifeline blocks in practice

Many electric and water utilities price the first block of use low and charge more for each block above it. Applied to the floor, it works like this:

1. **Size the block for each essential** from the national standard: enough energy for heating, cooling, cooking, and appliances; enough water for each resident; housing sized to the household; essential healthcare in full. A documented medical need raises that home's block,

as California's Medical Baseline allowance does today for life-support equipment and listed conditions.

2. **Make the block free.** Within it, nobody pays, applies, or gets means-tested.
3. **Price use above the block** at what the extra use costs the town.
4. **Send that revenue to maintenance first,** which answers the question of who keeps the machines running after the gift-back.

This solves three problems at once. A price signal at the margin stops overuse (use rising because something's free) at the edge of the block. Delivering goods rather than cash avoids the inflation risk DeepMind's economists raise about cash. And prices replace policing: nobody needs a visit for running the air conditioning; they just pay for the extra.

Services fit the same pattern. Essential care, schooling, and transport sit inside the block. What lies beyond need, like a private room, a premium class, or a celebrated teacher's seminar, is priced. That's where the relational sector lives.

Deep dive: will free essentials be overused?

The Jevons paradox is real, but it applies unevenly.

- **Many essentials saturate.** People eat about the same whether food is free or not, and one home per household is enough.
- **Some don't.** Energy, garden water, transport, and compute can grow without limit. The block covers a generous amount, and use above it moves into the priced tier.
- **Rebound lives above the floor.** The big growth in consumption happens in wants (travel, larger homes, new gadgets), which stay priced.
- **The bigger rebound is in production.** As machines make things cheaper, total use can grow faster than efficiency saves, which was Jevons' original point (Section 2). Prices can't stop that, because they fall too. A cap on the stocks can (Section 4).

Deep dive: handling the rare abuse

For the floor's goods, overuse is handled the way commons have always handled it, following Ostrom's graduated sanctions:

1. **Visibility first.** Town accounts show when a class is running short, which is usually enough to change behavior.
2. **A conversation.** Persistent outliers get a visit, not a fine. Most turn out to have a reason: a medical need, a broken appliance, a large household.
3. **Escalating limits.** For persistent abuse, a household's free amount in that class is capped, never below the national minimum and only for a set period, with appeal to the trust's mediation

process.

4. **Capacity as the default fix.** If a class runs short across many households, the answer is to build more, not to ration everyone, with the conservation flag covering the gap. Building more means more flow: more clean power, more recycling, more desalination. Where the shortage is a stock, like an aquifer, more pumps only drain it faster, and the stock rule decides instead.

One more tool fits, in a privacy-safe form: on-device private accounting, which helps a person notice and avoid hoarding. It lives on your own device, it's seen by no one else, and it reports nothing. What you use for your essentials is never scored.

For machine labor, the only enforcement is the one in the core design: a review of outsized use while a flag is on, by the trust's elected board. Otherwise the wear allowance simply puts the heaviest users last when capacity is tight.

Deep dive: what the floor doesn't cover, and why money stays

Alex Imas argues that scarcity won't disappear after AGI; it will relocate. As incomes rise, spending shifts toward goods where a human is part of the value: a meal from a particular chef, a teacher who knows you, a handmade object, a seat at a scarce event. About 40% of the US workforce farmed in 1900; under 2% does today, as spending moved to what farms can't make.

That sets the floor's boundary. It covers the essentials, generously. It can't cover the relational, creative, and status goods that grow with wealth, because their value comes from being particular and limited. Status goods are valuable precisely because not everyone can have them, so they stay priced and help pay for the floor.

That's also why the floor travels with a stake in what the machines produce and a right to call on them, so people can build above the floor, not just rely on what lies below it.

7. Governance: proven commons rules, many owners, and data for coordination

Only the eight commitments of the charter are required of every town (core design). Everything in this section is a menu of proven options, not a rulebook, and each town chooses its own.

Ostrom's principles, applied

Community-owned infrastructure is a commons, and we know which rules make commons last. Elinor Ostrom won the 2009 Nobel in economics for showing that communities can govern shared resources without privatizing them or handing them to the state. A later review of 33 studies found support for her eight design principles in about three-quarters of cases.

Ostrom's principle	What it means here
1. Clear boundaries	The trust's members and the infrastructure it owns are defined in its charter
2. Rules fit local conditions	A desert town and a farm town write different rules for water and food
3. People affected make the rules	Members vote on the trust's rules, including algorithm objectives and the tier-1 list
4. Monitoring by accountable members	Resource accounts are open to members, and monitors answer to them
5. Graduated sanctions	Abuse of the floor meets a conversation first, then escalating limits
6. Cheap, fast conflict resolution	Local mediation, with the federation as appeal between towns
7. Recognized right to self-organize	Law recognizes trust charters (Section 9)
8. Nested layers	Towns inside the federation inside a national floor

Who runs what

Ownership follows the four-owner model in the core design. Operation follows the job:

Job	Run by	Example
Delivering the floor	The town trust, which answers for it under its charter	Water, power, the shared essentials fleet
Standing services	Machines by default, joined by anyone certified who wants to; resources follow the output residents use	The clinic, the bakery, repair
Projects	Parties, for the length of the quest	Restoring a creek, building a school
Your own tasks	You, on your personal machine, doing the work you want	Your workshop, your garden, your research
Anything bigger than a town	The federation of town trusts	The regional fab, the grid backbone, shared reserves of machine labor and goods, pooled essentials like specialty hospitals and medicines, the market between towns

Parties end when their quests do, and so do their leaders' terms.

The priority list, consent first

The tier-1 list (core design) also ranks something broader: the learning and skill areas a society needs most. That idea comes from my November 2025 post, *Building the Economic System That Takes Us Past AGI*. Society stack-ranks the skills it most needs and resources them. This version is built to avoid surveillance capitalism:

- **Consent first.** Contributing is opt-in.
- **Local by default.** Personal spaces are never recorded for anyone else.

- **Contributors own their data and keep a share**.

Data Foundries: the one place people are recorded

Robots learn physical skills from people doing them, and that data has value. A Data Foundry is "a place where people practice skills, get coached, and get paid for recordings they collectively own": a workshop, kitchen, gym, clinic, or room in the library. You don't have to live there.

It's the one sanctioned exception to measuring flows, not people, and it runs on five rules:

1. **Consent.** Recording is never a condition of housing, food, or care.
2. **Cooperative ownership.** Contributors own the recordings together and license them; they never sell them outright.
3. **Payment.** A session rate, plus a dividend for the life of any model trained on the data.
4. **Revocation.** Contributors can withdraw their recordings at any time, so no future training run or license can use them. Models already trained keep their license and keep paying, because removing data from trained weights generally means retraining.
5. **Two-way exchange.** The town gets the skill back as machine labor on demand.

Tasks, not people, "graduate" to machines, and the standard for when a machine can safely take over a task is set by the guilds and domain experts who know the work, then built into the machines' own safety protocols and into how people are trained, not policed by an outside review. Because guilds aren't paid for floor work, they have no reason to set the bar higher than safety needs.

A Foundry is a bridge for the years before the floor exists: "A wage for data trends toward zero. A share of the model doesn't." The first one is a Stage 1 experiment, scaled up when the Stage 2 gate opens (Section 10).

Forming parties: protocols, not platforms

If machines help form parties, someone has to run the matching. If one company owns it, that company becomes the new corporation.

The economist Yanis Varoufakis calls today's version *technofeudalism*: platforms like app stores and online marketplaces that own whole markets and charge rent to everyone passing through. A central party-matching platform would be the ultimate cloud fiefdom, taking a cut of every quest on Earth.

The alternative is an **open protocol**: a shared set of rules anyone can use, the way nobody owns email (RFC 5321). Mike Masnick made the general case in his essay "Protocols, Not Platforms" (2019).

Under the protocol, anyone can post a quest and send out a **call for aid**. It goes first to your local network, then your region, then to guilds and talent networks around the world. No central hub decides who gets to form a party, and no one collects rent on the quest. Like Paul Baran's networks, it has no single point that can fail or be captured.

Data for coordination, not command

Measuring everything makes the economy easy to coordinate. It also builds the perfect control panel for whoever holds it. The goal is the first without the second, and that's an architecture choice, not a promise.

On people specifically, there are two options:

	Option A: person-level accounts	**Option B: facility- and community-level only**
What's tracked	Each person's hours, contributions, and use	Flows through meters, warehouses, and plants; never individuals
Strength	Fine-grained fairness and reputation	Privacy by design; nothing to misuse
Weakness	A surveillance economy that prices people as inputs	A coarser view of who contributes what
Fits the design?	Conflicts with the human-will rule	Fits: machines cover needs, so people needn't be counted

My recommendation is Option B. With machine labor covering what people don't want to do, the economy doesn't need to know what anyone did today. Reputation stays where it lives now, with people and the communities that know them. The one consented exception is a Data Foundry, which records skills, not lives, under the rules above.

Five architecture rules keep the tracking pointed at coordination:

1. **Local ownership of data.** Each town holds its own accounts. Other towns see only what it offers or requests.
2. **Minimum necessary data.** Measure flows, not people. Aggregate before sharing.
3. **No central switch.** There's no single place where anyone can turn a community's supply on or off.
4. **Open code and open audit.** Anyone can check what the meters and algorithms do.
5. **Exit with your town.** A community can leave the network with its infrastructure and its records, once it settles its share of the network's outstanding capital.

Deep dive: who owns the data?

If towns own their infrastructure, they should own their data too. The legal model is the data cooperative: an organization owned by the people whose data it holds, which decides collectively how that data is used. Each trust's charter makes it a data cooperative for its own accounts.

The regional ledger belongs to the towns together. Shared data fails when one competitor owns it, and works when it's neutral and held in common: Maersk and IBM's TradeLens shipping ledger shut down in 2022 after rival carriers wouldn't hand one of them the keys.

Deep dive: how decisions get made

Different decisions need different procedures, and the more a decision matters and the harder it is to undo, the more deliberation it gets:

Decision	Procedure	Why
Daily operations (maintenance schedules, routing)	Delegated to accountable roles and algorithms	Too frequent for votes; reviewed on a schedule
Annual priorities, the tier-1 list, algorithm objectives	Members' vote, ranked-choice when there are several options	Affects everyone; ranked choice avoids spoiler effects
Hard, contested questions (a drought water rule, a large build)	A citizens' assembly of randomly selected members, with their costs covered, then a members' vote	Deliberation by a representative sample, ratified by all
Charter changes	Two-thirds supermajority, with a waiting period	Protects the floor and minority rights from narrow majorities
Emergencies	A pre-authorized response team with powers that expire after 30 days	Speed, with a built-in end

Citizens' assemblies have a track record. Ireland convened one of 99 randomly selected citizens in 2016, on one of the most divisive questions in Irish politics; the assembly's position and the national referendum's result (64% and 66.4%) turned out strikingly close.

Quadratic voting, where people spend extra votes on issues they care about, is useful for allocating a shared budget across projects, but only with an equal allowance of voice credits that can't be sold or traded, so wealth can't buy votes. **Futarchy**, choosing policies by betting on outcomes, is dropped for the same reasons as real-money prediction markets.

Deep dive: keeping governance from being captured

Charter item 8 already requires three checks of every trust: separated keys, audits by members chosen by lot, and recall. Towns can add more from the menu:

1. **Separate the keys.** The people who keep the accounts, allocate, and audit are different people.

2. **Rotate.** Roles with power have term limits.
3. **Select some roles by lot.** Auditors and assembly members are drawn at random, in a draw anyone can check, which makes them hard to lobby in advance.
4. **Open books.** Every allocation decision and its reasoning are published to members.
5. **Recall.** Members can remove any officeholder by petition and vote.
6. **Exit.** Members can leave, and towns can leave the network with their infrastructure. The threat of exit disciplines everyone who stays. Towns settle what they owe first, as electric co-op members do: in 2024, United Power paid its generation co-op, Tri-State, $627 million in cash to leave.

8. Lessons from history

Versions of this idea have been tried, and their record is mixed in useful ways. The failures failed for fixable reasons, and the successes worked by measuring physical things at the source.

Technocracy and energy certificates (1932–1933)

The engineer Howard Scott's Technocracy movement proposed replacing money with energy certificates, handed out equally and expiring if not spent. Clubs spread across the US in the winter of 1932–33, when unemployment was around 25%.

It was never piloted. Interest collapsed fast: a newspaper exposé showed Scott had exaggerated his credentials, the movement's statistics contained large errors, and Scott admitted the system was undemocratic.

Lesson: a movement whose legitimacy rests on technical competence dies when its numbers are wrong, and a design that skips democracy loses the public. Hence this paper's fact-check appendix (Appendix A), and governance built on member control.

What this design is not. Technocracy replaced the price system with energy certificates and replaced elected politicians with scientists and engineers; its 1938 statement promised "no place for Politics or Politicians." Resource accounts invert each point. The ledger sits beside money, not in place of it (Section 3). Prices still allocate what's scarce at the margin (Section 4). Every trust is one person, one vote (Section 7). And no one's share is set by engineers: shares are equal by charter, and the floor and dispatch rights belong to the person (guard 3).

Wörgl's expiring money (1932–1933)

The Austrian town of Wörgl issued local "labor certificates" in 1932 that lost 1% of their value a month unless a stamp was bought, so people spent them fast. The scrip paid for public works:

a bridge, houses, a reservoir. Spending and tax collection rose, though most figures come from sympathetic sources. The Austrian National Bank ended it in 1933, asserting its monopoly on currency.

Lesson: expiry works as designed, but anything that looks like a rival currency will meet the central bank. This design applies expiry to physical perishables in the accounts, not to money, and never issues a currency.

Project Cybersyn (1971–1973)

Chile's government hired the cybernetician Stafford Beer to link about 500 factories by telex to an operations room in Santiago. It was never finished. In its one real test, a 1972 truckers' strike, the network helped keep food moving with roughly 200 loyal trucks. After the 1973 coup, the operations room was destroyed.

Lesson: real-time data is most valuable in a crisis, but a single central operations room is a single point of capture. This design keeps Beer's feedback loops and drops the central room: every town holds its own data.

The US acid rain program (1990–present)

The 1990 Clean Air Act amendments capped power-plant sulfur dioxide and issued tradable allowances, with continuous monitors on every regulated unit. By 2009, covered plants had cut annual emissions 64% below 1990 levels, at costs far below forecasts, with compliance close to 100%.

Lesson: this is resource accounting that worked at national scale. It measured physical flows at the facility, never the person, made the data public, and let the people closest to the problem find the cheapest fix. It's the template.

Peer-to-peer energy (2016–present)

The Brooklyn Microgrid let neighbors with solar panels sell surplus power to each other through a digital ledger. The technology worked at street level, but scale stayed small, partly because state utility rules limit neighbors trading power directly. The technology is the easy part; the law has to make room (Section 9).

Eight more cases

Case	Years	What it tested	Outcome	Lesson
Soviet central planning	1928–1991	Allocating a whole economy by plan	Chronic shortages; collapsed	Information and incentives can't be centralized
OGAS, the Soviet planning network	Proposed 1962	A national computer network for planning	Never built	Ministries wouldn't share data with a center they didn't control
WIR Bank, Switzerland	1934–today	A credit currency beside the national one	Survives, with tens of thousands of member firms; countercyclical	Parallel credit works inside the law
Sardex, Sardinia	2009–today	Regional mutual credit for small firms	Grew to thousands of members	Trust matters more than technology
Mondragon, Spain	1956–today	Worker-owned cooperatives at industrial scale	About 70,000 workers	Nested co-ops with a shared solidarity fund last
Kibbutzim, Israel	1910–today	Communities sharing all income equally	Most shifted to differential pay after a 1980s crisis	Full equality without exit valves strains under shocks
US rural electric co-ops	1935–today	Public loans to build, then community ownership	More than 900 co-ops serving 42 million people	The gift-back already exists
EU carbon market	2005–today	Tradable rights for a physical flow	Covered emissions about 50% below 2005 by 2024, after early over-allocation	Caps must be set from measured data, not lobbying

Soviet planning and OGAS are the cautionary tale. Managers hid capacity to keep targets low and hoarded inputs to meet them. The cyberneticist Viktor Glushkov's 1962 plan for a national planning network was never built, largely because ministries refused to give up control of their own information. The lesson is built into Section 7: never require anyone to surrender their data to a center.

Rural electric cooperatives are the closest model of the gift-back. In the mid-1930s, nine of ten rural American homes had no electricity, because investor-owned utilities wouldn't build where customers were sparse. The Rural Electrification Administration lent money to farmers who formed cooperatives, and by 1939 there were 417 co-ops serving 288,000 households. Today they serve 42 million people. Public money built the lines; communities own them. That's Stage 3, already proven once.

Kibbutzim carry a subtle lesson (this summary is approximate). Communities that require equality in everything strain when shocks hit and members' wants diverge. This design equalizes the floor and leaves everything above it free, which is roughly where most surviving kibbutzim converged.

Community wealth funds show resource rents can be held in common for decades: Alaska has paid every resident a dividend from its Permanent Fund since 1982, and Norway's oil fund is the world's largest sovereign wealth fund. This design's variation sends public money through community investment funds that build towns' infrastructure and give it back, instead of mailing checks.

Takeaways

1. Get the numbers right, and publish how you checked them.
2. Pilot small, publish results, then scale.
3. Measure physical flows at the facility, never the person.
4. Avoid central control rooms and anything that competes with the national currency.
5. Secure legal room before building, not after.

9. The law: mostly constitutional, and clear of the traps

Checked against the Constitution, almost all of the design fits, and the two pieces that didn't (a compelled gift-back and a federal land tax) have been redesigned. The rest of this section keeps the core pieces out of securities, money, and utility traps. It maps the issues; it isn't legal advice, and each pilot needs counsel.

The constitutional findings

Finding	Case or text	What it means for the design
The floor is within the general welfare power	*United States v. Butler* (1936); *Helvering v. Davis* (1937): "Nor is the concept of the general welfare static."	Congress can fund a national minimum floor
Washington can't commandeer towns	*Printz v. United States* (1997)	A federal floor is run federally or joined voluntarily
The formula and two rates are covered	The 16th Amendment: income "from whatever source derived, without apportionment"	One formula with a labor rate and a capital rate is constitutional
Don't tax unrealized gains	*Moore v. United States* (2024), upheld 7–2 on narrow grounds, with realization left open	Gains are taxed at sale or at death, never on paper
Land-value taxes belong to states and cities	Federal direct taxes must be apportioned by population	No federal land tax; states and cities can tax land

Finding	Case or text	What it means for the design
Trusts are one person, one vote	A charter choice, not a constitutional duty. *Avery v. Midland County* (1968) covers bodies with general governmental powers; *Salyer* (1973) and *Ball v. James* (1981) exempt narrow-purpose districts, which is what a trust is. State cooperative statutes allow equal votes, and federal funds can require them as a grant condition (*South Dakota v. Dole*, 1987)	Equal votes in every trust, set by charter and grant terms
Equal from day one	*Zobel v. Williams* (1982) struck Alaska's dividend that paid more to longer residents; *Saenz v. Roe* (1999)	Membership starts the day you register; portable shares advance the right to travel
The gift-back is by contract, never compelled	A forced transfer is a taking under the Fifth Amendment; build-operate-transfer and fair-value buybacks aren't	Gift-backs are agreed up front
Guilds train, certify, and collect, but never fix prices	*Goldfarb v. Virginia State Bar* (1975); *BMI v. CBS* (1979) for blanket licenses	Guild collecting bodies are legal; price-fixing isn't

Where financial law stands (as of October 2026)

- **Securities:** the Howey test still decides what counts as an investment contract: money invested in a common enterprise, expecting profit from others' efforts. In March 2026, the SEC and CFTC issued a joint interpretation of how it applies to crypto assets, without replacing it. For co-op shares, the Supreme Court held in *United Housing Foundation v. Forman* (1975) that shares in a housing co-op, bought to get a home and resellable only at cost, weren't securities. Shares here are never bought at all.
- **Stablecoins:** the GENIUS Act, signed July 18, 2025, created the first federal framework for payment stablecoins. It takes effect by January 18, 2027 at the latest.
- **Market structure:** the CLARITY Act passed the House in July 2025. On September 15, 2026, a Senate vote to advance it failed 49 to 50. There's no federal market-structure law for digital assets yet.

How each piece fits

Piece	Legal risk	Design that avoids it
Universal basic capital shares	An investment in a venture can be a securities offering	Membership in a cooperative or state-chartered trust: unsellable, portable, one vote each, never bought
Resource account entries	Low: records of physical stocks, like a warehouse ledger	Never bought, sold, or redeemed for money
Dispatch rights	Could look like a tradable claim	An equal right to call on machine labor, never sold or converted to dollars

Piece	Legal risk	Design that avoids it
Need-based credits	Could look like a currency if traded for dollars	Issued by need, spent only in the federation's reserve auctions, never traded between towns or redeemed for cash
Party profit-sharing	Partners sharing profits from others' work can trigger Howey	Partners who actually work the quest, in single-use companies, as film productions use
Energy shared between neighbors	State utility rules often bar direct sales	Electric co-ops, community choice aggregation, microgrid statutes, and regulatory sandboxes
Any token on a public chain	Securities and money-transmission rules	Not needed for Phase 1 of the ledger

The Wörgl lesson applies directly: nothing here looks like a rival national currency. The floor is provided in kind, credits never become cash, and dollars stay dollars.

Questions for counsel before the first pilot

1. Which trust form gives members ownership and votes without creating securities: cooperative, land trust, or state-chartered trust?
2. Is in-kind universal provision taxable to recipients under federal and state law, and does that change if a cooperative provides it to its members?
3. What does the state's utility code allow a town trust to generate, store, and deliver to its own members, and to share between neighbors?
4. Do need-based credits trigger money-transmitter licensing if they never touch dollars, and does the federation's netting of members' trade accounts?

Deep dive: what counts as private money

The US doesn't ban every private unit of value; it bans things that pose as, or compete with, the national currency. Gift cards, airline miles, and business barter networks are legal. Coins meant to circulate as money aren't: in 2011, a federal jury convicted the creator of the "Liberty Dollar" on all counts.

Need-based credits and dispatch rights stay well on the safe side. They work only inside a defined system, can't be bought or cashed out, and look more like Feeding America's shares, or a cooperative's internal accounting, than like money.

Deep dive: energy law is already moving

In 2020, the Federal Energy Regulatory Commission's Order No. 2222 required regional grid operators to let aggregations of small resources (rooftop solar, batteries, demand response) compete in wholesale markets. A town's microgrid could, in principle, sell its surplus into the

regional market as an aggregation. The hard part remains the retail side, governed by state utility codes. The practical routes are electric cooperatives, community choice aggregation, and state microgrid or sandbox statutes.

Deep dive: the cooperative toolkit

Need	Existing legal form
Owning a town's essential infrastructure	Consumer cooperative, municipal utility, or state-chartered trust, separate from local government
Owning the land under homes	Community land trust
Running energy assets	Electric cooperative, under state cooperative statutes
Financing the build-out	Public loans on the rural electrification model (today's USDA Rural Utilities Service); community development financial institutions (CDFIs); state community-investment exemptions
Federating towns	A second-tier cooperative (a co-op of co-ops), as Mondragon and electric co-op federations do
Holding data	A data cooperative under the trust's charter
Forming a party	A partnership or single-purpose LLC with a finish line in its charter

Deep dive: tax, privacy, and other countries

- **Tax.** Whether in-kind provision is taxable to recipients depends on who provides it and how. Each pilot needs a ruling or opinion before launch.
- **Privacy.** Pilots should meet the strictest privacy law that could apply, including state statutes and, for any European participants, the EU's General Data Protection Regulation.
- **Other countries.** The EU regulates crypto-assets under its MiCA regulation, and most countries have cooperative and utility law like the US forms above. A pilot outside the US should start from that country's cooperative law, because this design doesn't need tokens to work.

10. Rollout: from here to there

The next economic system will be short to codify and long to deploy. It gets written into law within a decade and built out through the 2030s and 2040s, in five stages that advance on data, not dates.

One clock: five stages

The build plan is five stages. Their dates are estimates, not promises: stages overlap, and each advances on a trigger, so if the numbers turn early, the build-out speeds up instead of waiting for its date. Two other names map onto them. The **phases** are the long arc: **scarcity** now, what Donella Meadows called overshoot; a **transition** through Stages 1 to 4, to the early 2040s; and **abundance** from Stage 5, in Meadows' words a world where "the basic material needs of each person on earth are satisfied," within physical limits. The **handover** is Stages 1 and 2, when the economic system itself changes: intelligence on demand, then machine labor on demand. It began around 2020 to 2022, and the new system should be codified between the late 2020s and the early 2030s; the ownership form to codify is universal basic capital. The three switches and three dials (Section 15) aren't separate clocks: they're the triggers that move the stages and the safety net.

Every past handover between economic systems has been shorter than the last: roughly 6,000, then 450, 250, 75, 30, and 18 years. After the first, each lasted about 0.3 to 0.6 times as long as the one before. That suggests the next one takes 5 to 11 years. It's a useful motif, not a forecast.

Each handover has run on the same five mechanisms:

1. A technology changes what's scarce.
2. The old tax base erodes.
3. A shock breaks institutions.
4. Prototypes lying around get adopted.
5. The new system codifies an ownership form and a tax base.

Seven systems have come and gone this way, from foraging bands to today's financial and information capitalism. This time the technology is machine intelligence, the eroding tax base is wages, and the shock may already have started. The prototypes to have lying around are pilot pairs, town trusts, and resource accounts.

Why there's urgency

Nobody knows how fast machine labor will displace jobs, so this design plans against scenarios, not one curve. Two published scenarios bracket the concern. *AI 2040: Plan A*, a recommendation rather than a prediction, has an employment rate falling to about 12% by 2040. The Android Dreams scenario has unemployment approaching 90% by 2045.

Bits move faster than atoms. Screen work may stop paying by 2028, but the floor still has to be built. That gap is the reason to start now.

Already happened: the handover begins (about 2020 to 2022)

- **2020:** the pandemic shock, and a test of emergency rails: the first relief payments reached bank accounts 14 days after the CARES Act became law.
- **November 2022:** ChatGPT's release, the visible "big bang" of a new technological paradigm in Carlota Perez's sense.
- **2026:** labor's share of income hits 52.8% in the second quarter, a record low since 1947. Employment of young workers in the most AI-exposed jobs is 19% below where it would be had it kept pace with less-exposed peers, a descriptive result, not a causal one, and there's no economy-wide displacement yet (Section 14).
- **October 2026:** home humanoids are announced, priced, and in production, but not yet in homes at scale, which leaves a little time to get ownership right.

The five stages

Stage	Estimated dates	What changes	Gate in
1. The machine intelligence age	Now to about 2030	Intelligence on demand everywhere; AI does a growing share of knowledge work; wages stall in the most exposed jobs	Under way
2. Machine labor arrives	About 2028 to 2035	General-purpose robots fill shortages in logistics, construction, care, and services; prices for automated services fall	AI revenue reaches a set share of the knowledge-work wage bill, or the young-worker employment gap passes a set threshold (illustratively 25%)
3. The build-out	About 2030 to 2040	The scarcity flywheel spins up; towns build microgrids for what they can't go without and trade for the rest	Robots fall below a set cost per hour of work, **and** pilot pairs pass their two-year tests
4. The gift-back and the floor	About 2035 to 2045	Infrastructure transfers to towns at scale; the lifeline block becomes real; the market between towns and the shared reserve link them	Labor's share falls by a set amount over a few years (the Switch C trigger, Section 15), **or** towns reach sufficiency milestones in critical classes, whichever comes first
5. Node states	2040 and beyond	Resilient communities become the main way people organize their lives; parties and guilds replace most corporate employment	A majority of people live in towns with a completed gift-back

Stage 4's gate cuts both ways: good news (towns reaching sufficiency) or bad news (labor's share falling) can pull the floor forward.

Stage by stage

Stage 1: the machine intelligence age (now to about 2030). Build the prototypes:

- **Pilot town pairs:** one town with spare food and one with spare energy, 1,000 to 5,000 people each, running the minimum viable design with resource accounts for energy, food, and water, and a floor that starts with those three plus primary care, including telehealth, and personal machine intelligence with the compute to run it.
- **One Data Foundry,** as an experiment, with the Data Foundry rules (Section 7) in its charter. It scales up when the Stage 2 gate opens.
- **Legal templates** for trusts, single-use companies, and guilds.
- **Owned, local-by-default personal machine intelligence** with portable memory, in the floor from the start, and protected by the privilege proposed in Section 16.
- **The safety net's first switch,** and every later trigger, legislated in advance (Section 15).
- **The slow things, started now:** permits, surveys, and long-lead orders for transmission, refining, and fabs. That's the first step of the build order (Section 2), because these take years to come online.
- **Signposts:** labor's share of income (the trend, not the level); payroll tax receipts as a share of federal revenue; the share of tasks AI can do from start to finish. Outside dates: the EU battery passport becomes mandatory on February 18, 2027.

Stage 2: machine labor arrives (about 2028 to 2035). Pilots link up and share data standards (Appendix B). Some pilot pairs add need-based credits, to test whether they serve a poorer town better than dollar trade alone. Signposts: robot deployments per worker, prices of services machines now provide, and the gap between productivity growth and wage growth. The physical deadline lands across this stage and the next: Gaya Herrington's update of *The Limits to Growth* shows a possible halt "over the next decade or so" (Section 12).

Stage 3: the build-out (about 2030 to 2040). Every new town's infrastructure is built with resource accounts from day one, by parties (at first, AI-enabled startups) under build-operate-transfer contracts, with the gift-back written in. Gigafactories start shipping microfactory kits late in this stage. Humans are still needed for most physical tasks for at least the next 10 to 20 years. Signposts: the share of a town's essentials produced locally, energy cost per kilowatt-hour, and housing cost per square foot.

Stage 4: the gift-back and the floor (about 2035 to 2045). Ownership transfers to residents, one equal, unsellable, portable share each. The lifeline block covers everything reasonable today, and universal basic machine labor runs as a utility, including a personal robot for everyone. The cash floor shrinks as each essential moves in kind. Signposts: the share of household spending that goes to essentials (heading toward zero), and the number of towns that own their infrastructure.

Stage 5: node states (2040 and beyond). Sometime between 2040 and 2050, towns go beyond resilient: self-sufficient enough to trade surplus freely. At the limit, self-sufficiency is regional, and everything is made to be recycled. Growth starts turning outward, the last step of the build order (Section 2), as the heaviest digging, and the disorder it brings, begins moving where there's no

biosphere to harm. Meaningful asteroid tonnage is still decades away, but awe infrastructure (telescopes, open labs, dark-sky parks) starts now. A floor for everyone, a frontier for anyone.

How it connects to the tax plan

Section 16 sets out the tax path and the formula that runs it. The path shifts the base from wages toward land, resources, capital, and scarce-compute permits. Resource accounts make that shift workable: a tax on resource rents needs accurate measurement of resources, and the accounts provide it, measured at the facility, as the acid rain program did.

Deep dive: designing the first pilots

The first pilots should be designed to fail informatively.

Start with a pair, not a single town. Trade between towns is the novel part, and it can't be tested in one place.

Site selection:

1. An electric cooperative or municipal utility willing to partner, so energy accounts start from real meters.
2. Towns of roughly 1,000 to 5,000 people: big enough for real flows, small enough to know each other.
3. Local governments willing to sign an agreement covering data, zoning, and utility questions before launch.
4. A matched comparison town for each pilot town, so outcomes can be compared.
5. Climates and economies that differ, so results aren't an artifact of one place.

Evaluation. Outcomes are measured before launch and compared with the matched towns over the same period. Metrics and targets are published in advance, and an independent university team, not the operators, does the evaluation.

Metric	What it tests	Example target for year two
Account accuracy	Do the books match independent audits?	Within 2% for energy and water
Waste	Does visibility reduce spoilage and loss?	Food waste down by a quarter; water lost from pipes falling
Surplus moved	Does trade between towns beat today's markets?	Most offered surplus finds a taker within a week, and more of it reaches need than in comparison towns
Floor satisfaction	Do residents get what they need?	A majority rate the floor good or better

Metric	What it tests	Example target for year two
Participation	Do people take part in governance?	Assembly seats filled; turnout comparable to local elections
Time use	Does a secure floor add time for meaningful work?	More time on chosen work, care, and learning than in matched comparison towns, by time-use survey
Machine labor	Do the tiers serve people fairly?	Requests above the base met within a set time; flags rare and short; machines' fund condition holding steady as maintenance keeps pace with metered wear
Cost	Is it affordable to run?	Operating cost per resident falling year over year

Budget. Pilots in existing towns can start small, because the towns, the homes, and much of the infrastructure already exist. The main costs are metering, software, governance support, and evaluation. Data Foundries are town workshops, which keeps them inexpensive too.

Kill criteria. Each pilot runs two to three years and stops or is redesigned if any of these hold after its two-year test:

- The accounts can't be reconciled with audits within tolerance.
- Residents rate the floor worse than the comparison town does.
- Governance has been captured, or dispatch discriminates, despite the charter's checks.
- Operating costs exceed the measured savings, with no downward trend.

Publishing failures is part of the design. Technocracy died by claiming more than it could show.

Deep dive: pilot the simple version first

Pilots start with the minimum viable design and nothing else. Each extra mechanism is then added in some pilots and not others, so its effect can be measured against the simple baseline:

Mechanism	Tested against	Adopt only if it
Need-based credits	Dollar trade plus a shared reserve	Moves more surplus to need, with less waste, at acceptable cost
Ways of running the three tiers	The simplest ranking a town can run	Serves quests faster without anyone hoarding
Forecasting points	Public forecasts and market signals	Predicts local bottlenecks measurably better
Reciprocal commitments between regions	Town buffers plus one shared reserve	Handles correlated shocks noticeably better
Detailed governance procedures	The eight-item charter alone	Reduces capture or conflict in practice

Deep dive: stages advance on triggers, not dates

The economics literature spans too wide a range to commit to a calendar. Daron Acemoglu's estimates imply modest productivity gains over the next decade; Epoch AI's model allows growth many times faster than today; Dwarkesh Patel argues timing hinges on continual learning, which may take another five to ten years; and *AI 2040: Plan A* describes a deliberately slowed path (Section 14). So each stage advances when its gate opens, using the dashboard in Section 15.

11. Answering the critics

The strongest objections each have a direct answer, and most are answered by the design itself rather than by argument.

"It's central planning, and planning failed." Planning failed because one center tried to know everything. This design has no center: each town holds its own data, prices still carry local knowledge, ownership is split among four kinds of holders, and anyone can exit with their town.

"Won't the town become the new state?" It's the right worry: Madison warned that factions capture small republics most easily, and Pullman was a company town. So the trust is a utility cooperative with a narrow charter and no police, taxing, or zoning powers, and no say over speech. It must serve everyone without discrimination, the rights belong to the person, and owning, operating, and running the market are split among different bodies (core design).

"Prices hold knowledge sensors can't see." Agreed; that's Hayek's point, and the design builds on it. Resource accounts supply quantities. Values come from towns' trade, priced in dollars, and from need-based reserve auctions where trade fails.

"Energy can't measure value." Also agreed; that's Georgescu-Roegen's point. Energy is a budget here, never the unit of value.

"The tokens will just become money." The floor has no tokens. Dispatch rights and need-based credits can't be bought, sold, pledged, or cashed out. That's the line Wörgl crossed and this design doesn't.

"Measuring everything is surveillance." It would be if it measured people. The design measures flows at facilities and towns, keeps data local, and has no central switch. The acid rain program monitored every smokestack in the country without monitoring a single worker.

"Sensors can be faked." The first draft claimed AI vision "solves" this. It doesn't. What works is layered: signed meters, cross-checks against independent data, physical audits, and consequences for false reports. Drone inventory is a promising layer: in a 12-month pilot, Tinamu and the inspection firm Cotecna reported up to 50 times faster inspection reports.

"Bubbles happen anyway." Yes; the tulip mania traded real bulbs. The narrower claim holds: the floor isn't traded, so it can't bubble. Anything still traded can.

"It's illegal." Parts would be, if designed carelessly. Section 9 maps every piece to a legal form, and finds the design mostly constitutional.

"Isn't the cash floor just UBI?" Close. It's paid monthly to everyone, but the one tax rate recovers it as income rises, with no separate phase-out, so for most working adults it nets out. And it's the end state of the cash path only: the check shrinks as the floor of things grows.

"People won't do anything if the essentials are free." That's the meaning question, and the whole design rests on it. People don't stop wanting to build things when they stop needing a paycheck to eat. If a secure floor turns out to *reduce* time spent on meaningful work, the central bet is wrong, and Section 13 says how we'd find out.

Deep dive: seven harder objections

"Mises showed you can't calculate without prices for capital goods." In 1920, Ludwig von Mises argued that without market prices for machines, land, and materials, planners can't tell which production method is cheaper. It was aimed at economies that abolished markets for capital goods. This one doesn't. Towns build with dollars and priced inputs, trade at locational prices, and see physical accounts besides. That's more information than a firm has today.

"If the essentials are free, people will free-ride." With machine labor on demand, there's much less to free-ride on: machines do the work nobody wants. Civic work is handled by rotation and random selection, chosen work by parties and guilds, and hard roles by recognition. Mondragon and the electric co-ops show members will govern their own institutions for decades when the institution is visibly theirs.

"Rich towns will pull away from poor ones." This is the most serious objection, because endowments differ. Five rules push against it. Half of every share sits in the federation, so no town's residents carry only their own town's luck. Build-out goes first to towns furthest from the floor, as rural electrification went where utilities wouldn't. The national minimum covers every person. Need-based credits backstop trade. And membership is open from day one, with growing towns getting build-out priority, so a town that closes its doors loses access to surplus from other towns.

"Whoever supplies the robots and software will own the system." A real risk. The defenses are open standards, open-source reference software, multiple hardware vendors, right-to-repair requirements in procurement, compute cooperatives, and ownership of the hardware itself. Rural co-ops bought their poles and wires outright; towns should own their machines the same way.

"Critical minerals and cyberattacks make towns fragile." Towns will import critical minerals for decades, and any network can be attacked. Microgrids can disconnect and run on their own when

the wider grid fails, fleet controls can run locally, cut off from outside networks, in the same way, and the shared reserve holds critical stocks. None of these makes a town invulnerable, but together they make it more resilient than one that depends on a single distant supplier.

"The accounting will cost more than it saves." The test is written into the pilots: operating cost per resident must fall over time and stay below measured savings, or the pilot stops.

"Free machine time will be wasted." The system is built for peak demand, so most of the time it doesn't matter. Energy and materials beyond the free block, and everything made for sale, are priced, which puts the signal where the scarcity is. And in a shortage, the conservation flag puts the essentials first. Wear is metered and counted against an equal allowance, so when machines are scarce, the heaviest users wait rather than pay.

12. Systems dynamics: what makes this grow or stall

This design is built on Donella Meadows' way of seeing. Stocks and flows define what's scarce. Feedback loops decide whether a system grows or stalls. And some places to intervene matter far more than others.

Meadows as the frame

Leverage points. In *Leverage Points* (1999), Meadows ranked twelve places to intervene in a system. Parameters like tax rates and subsidies ranked last, 12th of 12. Information flows (who can see what) ranked 6th, and the rules of the system 5th. Resource accounts change who can see what, and the charter changes the rules, so that's where this design pushes.

Success to the successful. One of Meadows' system traps: winners get the means to win again, until a few hold everything. Capped returns for builders, a floor that can't be lost, and shares that can't be sold each cut that loop.

Delays. When fast loops and slow loops interact, systems overshoot and oscillate. That's why triggers are set in advance, before the data turns, rather than debated after.

The physical deadline

Meadows and her colleagues' *The Limits to Growth* (1972) modeled the world economy's stocks and flows with a computer model called World3. In 2021, Gaya Herrington compared its scenarios with real-world data. The closest-fitting runs show "a halt in welfare, food, and industrial production over the next decade or so", right on top of Stages 2 and 3 of the build-out.

The one scenario that doesn't decline, the "stabilized world," takes technology plus limits we choose. A free first block, maintenance first, essentials first, conserved stocks, and pilot pairs are those choices.

Three caveats matter. World3 has no AI in it. Herrington calls her results preliminary. And the study is hers, not MIT's or KPMG's (where she worked).

The stocks that matter

Stock	Why it matters	Grows through	Shrinks through
Production capacity (energy, food, fabrication, machine labor)	Sets how much floor can be provided	Build-out, materials breakthroughs	Wear, underinvestment
Critical materials in use	Limits what can be built	Mining, recycling, substitution	Dissipation, export
Fund condition (soil, machines, buildings)	Determines future capacity	Maintenance	Neglect, overuse
Knowledge	Raises output per unit of energy and material	Research, guilds, documented learning	Loss of practitioners
Trust	Makes people report honestly and accept shared rules	Accurate accounts, fair allocation, visible results	Scandals, capture, broken promises
Floor coverage	The goal: the share of people whose essentials are met	All of the above	Shocks, failure of any of the above

Trust is a stock on purpose. Sardex's researchers found it fundamental; Technocracy lost it in months. It builds slowly and drains fast, which is why the accounts have to be right before they're big.

Reinforcing loops: what makes it grow

1. **The scarcity flywheel.** Better materials make better machines and labs, which find better materials. Resource accounts show which bottleneck binds.
2. **Network effects.** Each new town adds surplus others can draw on, which makes joining more valuable for the next town.
3. **Trust and data quality.** Accurate accounts build trust; trust brings honest reporting; honest reporting makes the accounts more accurate.
4. **The ownership loop.** Owning the machines turns productivity gains into a better floor and more machine labor for everyone, which builds trust and participation, which brings in more towns and capital. It's the counterweight to the concentration Trammell, Patel, and Restrepo warn about.

5. **The rebound loop.** Efficiency makes things cheaper, cheaper things get used more, and more use draws stocks down faster: the Jevons paradox (Section 2). It's the flywheel's dangerous twin. Caps on stocks (Section 4) break it, because a drawdown fixed in tonnes can't speed up.

Balancing loops: what holds it back

1. **Physical limits.** As easy sources run out, costs rise until new sources or substitutes arrive.
2. **Fund decay.** More capacity means more to maintain. The maintenance-first rule, funded from the trust's budget and sized by the wear its meters record, keeps the stock level.
3. **Coordination costs.** More towns and classes mean more complexity, which is why classes start coarse and governance stays local.
4. **Attention.** Too many decisions and dashboards produce disengagement. Delegation and random selection keep the load bearable.
5. **Backlash.** Success threatens incumbents whose business depends on scarcity. Wörgl and the Brooklyn Microgrid both met this loop.

The demand loop: the dangerous one

Layoffs cut wages, lower wages cut spending, falling sales push firms to automate further, which brings more layoffs. That's the spiral in Citrini Research's 2028 scenario. It's reinforcing, and it weakens as the floor grows, because necessities stop depending on wages (Section 15).

Delays: why patience is a design requirement

The loops run at very different speeds. Accounts can change in weeks. Trust takes years. Infrastructure takes longer still: even after machine intelligence helped find a major copper deposit in Zambia, the mine was expected to take around a decade to reach production. The defenses are forecasts that look past the delays and stage gates that keep the program from scaling faster than trust and infrastructure can follow.

Efficiency versus resilience

Resilience costs efficiency, so buy only as much as you need. Making everything locally would make towns poorer. Local capacity and buffers in critical classes (energy, water, food, and medicine) buy resilience where a disruption hurts most, and trade captures efficiency everywhere else, until the factory factory makes regional self-sufficiency cheap.

13. Research agenda: what we don't know yet

This paper makes claims that can be tested, and the program should spend real money trying to prove them wrong.

Design questions

1. **Granularity.** How fine do resource classes need to be before accounts are useful, and when does added detail cost more than it's worth?
2. **The size of the block.** Does "what a typical household uses today" make a workable national minimum for each essential, how should each block split between a base for the home and an amount per resident, and how often should it be reset?
3. **Charter limits for the flag.** Which resource thresholds should switch on the conservation flag, and how often do well-set limits fire?
4. **The need index.** If need-based credits are needed, which measures of productive capacity and documented shocks are hardest to game?
5. **Expiry rules.** Which perishable classes benefit from lapsing entries, and which just create churn?

Behavioral questions

1. **Reporting honesty.** How often do facilities misreport when consequences are reputational rather than financial?
2. **Participation.** What share of members take part in governance over years, not months, and which roles stay hard to fill?
3. **Use of the floor.** How does use of essentials that saturate (food, housing) compare with those that don't (energy, transport), once both are free up to a block?
4. **Meaning and contribution.** Do people with a secure floor spend more time on parties, guilds, care, and learning, or less? This is the design's central claim, and it's testable.
5. **Resources that follow use.** Do inputs that follow what residents actually use reward good work without squeezing out people who do it for fun?

Machine labor questions

1. **Dispatch rights in practice.** How do towns run the three tiers? How often does the conservation flag fire, and do quests get what they need without anyone hoarding?
2. **The tier-3 reserve.** How large a reserved share for quests protects minority projects without starving the essentials?

3. **Wear allowances.** How large should each person's wear allowance be, and does least-used-first at peak times keep machines healthy without discouraging ambitious quests?
4. **The cost of the human-will rule.** How much machine output does a town forgo when people choose work machines could do, and do members think it's worth it?
5. **Compute cooperatives.** Can cooperatives running open-weight models meet most of a town's needs, and how far behind the frontier can they be before members defect to the labs?

Network questions

1. **Inequality between towns.** Do the federation half of each share, build-out priority, and the national minimum actually narrow gaps between well- and poorly endowed towns?
2. **Moving.** Do arrivals and departures between towns net out in practice, and does build-out priority keep up with growing towns? When a town is full, how fast do newcomers move from a regional home into one in town?
3. **Shock response.** How does the shared reserve perform in a real drought or grid failure?
4. **Scale limits.** At what network size do coordination costs outweigh benefits, and does federating into regions solve it?
5. **The two-way backstop.** When a town's capital fails, does the network floor hold? When floor quality slips, does ownership correct it?

Results that would prove this design wrong

A paper that can't be falsified isn't worth much. The design should be considered a failure if pilots consistently show any of these:

1. Resource accounts can't be kept accurate at a cost below the savings they bring.
2. Trade between towns, with or without need-based credits, moves surplus to need no better than today's markets.
3. Residents of pilot towns are no better off than matched comparison towns after several years.
4. Governance concentrates in a few hands despite the charter's checks.
5. A secure floor *reduces*, rather than increases, the time people spend on meaningful work. That last one tests the central bet of the whole design.

Each is measurable, and each is written into the pilot evaluation in Section 10.

14. What the AGI economics literature says, and this paper's answers

Between 2023 and 2026, economists at universities, AI labs, and investment firms produced a serious body of work on how AGI changes the economy. This section summarizes what they found, answers each major claim, and says where this paper changed because of them.

Where the field agrees

1. **If machines do all the bottleneck work, labor's share of income falls sharply.** Pascual Restrepo shows that once AGI can do every task essential to growth, wages can stay at or above pre-AGI levels while labor's share of GDP converges toward zero. Philip Trammell and Anton Korinek reach the same result. Alex Imas dissents only on "to zero," because of the relational sector.
2. **Wages collapse only under specific conditions.** Korinek and Donghyun Suh frame it as a race between automation and capital accumulation: if the tasks humans can do are bounded and automation completes, wages collapse; if automation is slow, they can keep rising.
3. **Aggregate effects are small so far, and young workers are the early signal.** The Yale Budget Lab found, as of September 2026, no clear evidence of AI-driven labor market disruption. But Erik Brynjolfsson, Bharat Chandar, and Ruyu Chen found that employment of 22- to 25-year-olds in the most AI-exposed jobs stood 19% below where it would have been had it kept pace with less-exposed peers. They call the result descriptive, not causal.
4. **Ownership of capital and compute decides who benefits.** Universal basic capital, sovereign funds, AI 2040's citizen shares, and Trammell and Patel's capital tax are all answers to the same question: who owns the machines.
5. **Policy should be designed before the shock and triggered by data.** Julian Jacobs and Alex Imas recommend sequencing policy around observable thresholds: unemployment insurance and an earned income tax credit paid through the year now, a negative income tax if wages compress, and universal basic capital "designed now but deployed" once labor's share keeps falling.

Where the field disagrees

Question	One side	The other side	What would settle it
How fast?	Daron Acemoglu: no more than 0.66% total productivity gain over ten years	Epoch AI's GATE model: growth 2 to 20 times faster than today during automation	AI revenue versus the knowledge-work wage bill; productivity; real interest rates
What gates it?	Dwarkesh Patel: the lack of continual learning, which may take 5 to 10 more years	Scaling optimists: current methods suffice	Whether models learn on the job

Question	One side	The other side	What would settle it
A demand spiral?	Citrini Research: white-collar layoffs cut spending, which drives more automation	Citadel Securities: AI is a supply shock, and adoption isn't recursive	Top earners' spending; corporate saving versus investment; tax receipts
Do human jobs last?	Imas: a growing relational sector	Restrepo: wages pinned to the compute cost of replicating the work	Spending shares; premiums for human-made goods
Cash, services, or capital?	AI 2040: Plan A's cash dividend	Jacobs and Imas: universal basic capital	Price responses to transfers when supply is tight
Can capital be taxed?	Trammell and Patel: only globally	Acemoglu, Manera, and Restrepo: domestic reform works	Capital mobility; minimum-tax compliance

The major claims, and how this paper answers them

Claim	Source	This paper's answer	Where
Labor's share goes to zero; owners win	Restrepo; Trammell and Korinek; Trammell and Patel	Make everyone an owner of the systems that produce their floor	Core design
Wages collapse near full automation	Korinek and Suh	Decouple living standards from wages: the floor, plus ownership, plus access to machine labor	Core design
Keeping humans in jobs costs output	Korinek and Suh's "nostalgic jobs"; Restrepo; Catalini and Hui's automation trap	The human-will rule is a right to do work, not a wage; the cost is small and chosen	Below
A demand and credit spiral	Citrini Research	A floor households don't buy with wages, plus the cash bridge and credit forbearance	Section 15
Frontier labs will build moats	Patel; Drago and Laine	Compute cooperatives, portable memory, owned personal machine intelligence, and a public claim on frontier rents	Section 16
Scarcity relocates to human-centered goods	Imas	Money persists for those; guilds and parties are where that work lives	Sections 6, 7
AI agents will form their own economy	Tomašev and coauthors	Need-based credits adapt their equal-endowment auctions: need sets each town's endowment, and the auctions cover only the federation's reserve	Section 4
Cash transfers cut work slightly and help with essentials	OpenResearch	Cash is the right bridge and the right stabilizer in a demand shock, not the destination	Section 15
Markets would price explosive growth in interest rates	Chow, Halperin, and Mazlish	Watch real rates as an outside check	Sections 5, 15

Claim	Source	This paper's answer	Where
Labor is overtaxed relative to machines	Acemoglu, Manera, and Restrepo	Two rates, no payroll tax, equal write-offs for workers and machines, and a transition automation levy	Section 16
Land and resource rents are a small base	Trammell and Patel: about 5% of income	Broaden rents to compute and frontier models; keep a capital-income tax through the transition	Section 16

On the cost of the human-will rule

This claim challenges the design most directly. Korinek and Suh show that reserving jobs for humans means "forgoing a growing fraction of output." Restrepo shows that where machines can do a job, wages get pinned to the compute cost of replicating it. And economists Catalini and Hui describe an "automation trap": once agents are cheaper, firms rationally drive human time to zero, which erodes the hands-on learning and human verification that safe deployment depends on.

All three are right about a world where people need jobs to live. The human-will rule is designed for a different world:

1. **It's a right to do the work, not a right to be paid for it.** The floor carries everyone's essentials.
2. **The output cost is small and chosen.** Machines fill every gap people leave, so the floor is never short. What's "forgone" is machine output that would have replaced work people chose to do.
3. **Some human work is the product.** In one of Imas's experiments, exclusivity raised the value of human-made art by 44% but AI-made art by only 21%. Where the human is the value, people pay a premium.
4. **Some human work is a safeguard.** Guilds protect verification, judgment, and oversight as human roles, so the skills to check the machines never disappear.
5. **It's a security feature** (see the human-will rule in the core design).

Above the floor, human work is for meaning, not income. Imas, Koh, and Legg sharpen Restrepo's point: once a model matches a skill, the wage for it falls toward the cost of compute, and it can fall before anyone is laid off (*The Economics of Intelligence*). So the design doesn't promise that chosen work pays. Income comes from the floor, the share, and dispatch rights; work above the floor is done for meaning, status, and care. "A human gets first pick" means first pick of the work, not first pick with a wage.

Where this paper changed

1. **Cash has a defined role.** In a deflationary demand shock, cash is the right stabilizer. This design carries the same regime logic (Section 15): one negative income tax, the universal monthly cash floor, phased in as the end state and moved to full size early, as the bridge, if wages compress. The check shrinks as the lifeline block grows.

2. **Universal basic capital is the core,** delivered as membership in town trusts and their federation, with ownership split four ways so no one holder becomes sovereign.
3. **Universal basic machine labor completes the pattern,** as equal access distributed by demand.
4. **The timeline is triggered by data,** not fixed dates (Section 10).
5. **The tax plan follows the evidence:** two rates, no payroll tax, equal write-offs for workers and machines, and a transition automation levy (Section 16).

Where this paper still disagrees with the field

1. **Capital should be local and physical, not a portfolio.** Most universal basic capital proposals give people shares in a national fund. Shares in distant companies can crash, be sold, or concentrate. Shares in the machines that make your essentials can't be sold and keep producing whatever markets do.
2. **Access to machine labor beats a check.** AI 2040's plan pays citizens cash from compute and robot permits. Cash buys whatever supply exists; access to the machines *is* supply. That's why universal basic machine labor sits beside the capital.
3. **A global capital tax isn't the only answer.** Trammell and Patel argue it's "essentially the only way" to stop inequality growing extreme under full automation. It's needed for frontier rents. But if communities own the means of producing their floor, inequality in financial wealth matters much less for anyone's welfare.
4. **The demand spiral assumes people buy their essentials with wages.** A floor provided in kind breaks that loop where it does the most damage.
5. **Competition can aim at zero.** Today, companies compete to make their stock prices as high as possible. They could compete instead to make their goods so efficient to produce that they become free. With single-use companies and owned machines, that's the competition this design rewards.

Underneath all five sits a belief about people. The floor frees them for what no machine replaces in us: curiosity and care (service).

The closest outside proposal: Emad Mostaque

Emad Mostaque, a co-founder of Stability AI and the founder of the Intelligent Internet, published *The Last Economy* in August 2025. His destination is close to this one: "People need a stake in the abundance intelligence creates." The roads split at seven forks:

Fork	Mostaque	This paper
The floor	An "Abundance Dividend" of Culture Credits, plus a guaranteed compute quota and a personal AI agent (Chapter 14; Chapter 18)	Goods and services in kind, plus a personal machine you own

Fork	Mostaque	This paper
Money	A Foundation Coin, a variant of Bitcoin capped at 21 million coins (thesis)	Dollars first; a second ledger beside money; money for what stays scarce
Owner size	One "Champion" per jurisdiction, a US state or a country: "The cap table is the country"	Town trusts, federated for anything bigger
Sellability	Champions aim to list on public markets, and his company takes 10% founding equity	Unsellable, portable shares; builders take a capped return, then give it back
The human role	AI agents fill council seats, and "human overseers still sign the final transaction" (whitepaper)	Humans decide, not just approve: the human-will rule
Funding	Taxing intangible capital "is like trying to build a dam on a cloud"	One formula, two rates, and rents on land, resources, and compute permits
Speed	A thousand-day window, now "shorter than it was" (One Year On)	Bits move fast; atoms move slow; the floor still has to be built

Two of his ideas carried over into this design: stakes for every child at birth, and remote robot piloting performed in the same jurisdiction (the daily throttle, core design).

Slow, fast, or deadly: the same answer

Nobody knows how fast AI will move, so the design doesn't bet on a speed. It holds in all three worlds:

- **Slow:** universal basic capital shares what replaced the paycheck.
- **Fast:** a fleet owned by thousands of trusts can't be commandeered with one order.
- **Deadly:** the brake comes first, and sharing the prize makes agreeing on the brake easier.

Owned by many, inspected by all. The frontier can be declared and inspected. The everyday fleet should be owned.

A data snapshot, as of late 2026

Indicator	Reading	Source
Economy-wide AI disruption	No clear evidence	Yale Budget Lab, September 2026
Young workers in AI-exposed jobs	19% below expected employment	Brynjolfsson, Chandar, and Chen, August 2026
Labor's share of income	52.8% in Q2 2026, the lowest since 1947	Bureau of Labor Statistics
DeepMind's policy ratings	Universal basic capital first on agency (76.3) and ownership of gains (94.9), 10th of 11 on feasibility (33.1)	Jacobs and Imas, September 2026

Indicator	Reading	Source
$1,000 a month in cash for three years	Recipients worked 1.3 fewer hours a week and spent about $310 more a month, mostly on food, rent, and transport	OpenResearch, 2024

15. The demand and financial transition

The floor is a slow fix; a wage spiral is a fast one. The most dangerous years are the ones before the floor exists, when wages can fall faster than towns can be built out. So the safety net is legislated now, while things are calm, with three switches that turn on from the data.

The scenario to plan against

In February 2026, Citrini Research published "The 2028 Global Intelligence Crisis," which its authors called "a scenario, not a prediction." It describes a displacement spiral: AI improves, companies cut white-collar staff, laid-off workers cut spending, margins fall, and companies automate further. By June 2028, unemployment reaches 10.2% and the S&P 500 is down 38%, while nominal GDP keeps growing.

The rebuttals were strong. Citadel Securities argued that AI is a positive supply shock, pointed to software-engineering job postings up 11% year over year, and noted that recursive technology doesn't mean recursive adoption. This paper's view: the spiral is unlikely, but it's the most damaging plausible path, so the design plans for it.

Why the floor breaks the spiral, eventually

The spiral runs through one mechanism: households pay for necessities out of wages. Where the floor exists, necessities don't depend on wages, and the loop loses its most dangerous link. A household that still has food, power, housing, and healthcare doesn't default on them. Until the floor is built, the switches are the bridge.

A safety net with three switches

The sequence follows Jacobs and Imas, with this paper's towns as the final step. Each switch is legislated in advance with an off-trigger instead of an end date, and triggers watch change, not level.

Switch	Trigger	Response
A: now	None; build it in advance	Unemployment insurance for gig and contract workers; a monthly earned income tax credit, extended to workers without children; employer-led apprenticeships and retraining; make the 2020–21 temporary versions permanent
B: wages compress	Long unemployment spells rising and median wages falling, both for two quarters; or entry-level hiring and starting wages in AI-exposed occupations falling for two quarters	Move the cash floor (below) straight to its full size, so households whose earnings have fallen get the most from it; it steps back to its scheduled path on an off-trigger. This is the cash bridge. Add credit forbearance, and pair cash with in-kind provision where costs are already falling: healthcare and housing first
C: labor decouples	Labor's share down more than 3 points in 3 years while returns to capital rise	Accelerate universal basic capital: speed up the build-out and the gift-back, and pay the national frontier dividend and compute and robot permit proceeds into community investment funds

Triggers watch the change, so today's record-low labor share of 52.8% hasn't fired Switch C on its own. A rising concentration dial (below) also speeds up compute cooperatives and the gift-back.

Wages move before jobs. In Imas, Koh, and Legg's model, once AI matches a skill, its wage falls toward the cost of compute, and it can fall without any loss of employment. In their worked example, specialist wages fall from 4.15 to 2.90 while all fourteen humans stay employed (*Organizing Intelligence*). The evidence they assemble fits: junior employment in exposed occupations is down 7.7–19%, mainly through reduced hiring, and starting wages are down 4.2%, while senior employment and pay hold steady (Brynjolfsson, Chandar, and Chen; Hosseini and Lichtinger; Azar, Giné, and Sanz-Espín). So Switch B watches the entry level as well as unemployment.

A negative income tax is a single payment that shrinks as your earnings rise. Juliet Rhys-Williams sketched it in the 1940s, and Milton Friedman made it famous in *Capitalism and Freedom* (1962).

The cash path: one schedule

The bridge and the end state are one schedule, a **universal monthly cash floor**: $4,800 a year per adult and $1,700 per child at full size, paid monthly to everyone and indexed to prices. That's 30% of the 2026 poverty guideline. There's no separate phase-out: everyone gets the full payment, and the one tax rate recovers it as income rises, so there are no cliffs. At a 30% rate, an adult's check nets to zero at $16,000 of earnings, and for most working adults it nets out. A payment to everyone recovered by a flat tax is a negative income tax in another form (Hoynes and Rothstein), so there's no second program to run.

It's phased in. In year one, it pays out what the roughly 80 benefit programs it consolidates already cost, so the tax rate doesn't jump. If Switch B fires first, it jumps to full size and stays there until the off-trigger. It grows with the tax base to its full size, about $1.4 trillion a year (Section 16).

It's the end state of the cash path, not of the design. As each essential moves into the lifeline block, the check shrinks, until what's left is a little cash for extras and scarce things. The destination is the lifeline block.

Match the tool to the regime

The right tool depends on what kind of trouble it is:

Regime	Warning signs	Best tool
Demand shortfall (deflationary)	Falling prices, rising unemployment, weak spending	Cash (the bridge), credit forbearance, a paused debt surcharge
Supply shortage (inflationary)	Prices of essentials rising faster than other prices; shortages	Build capacity; provide in kind; point machine labor at the bottleneck
Ownership shock (labor decoupling)	Labor's share falling, returns to capital rising	Universal basic capital, accelerated

A check is the wrong destination, but it may be the right bridge.

Credit and housing

In Citrini's scenario, the financial damage comes through mortgages and private credit. Three measures limit it:

1. **A forbearance protocol, legislated in advance,** that pauses mortgage payments, and evictions for unpaid rent, for households whose income falls past a threshold, as was done during the pandemic.
2. **Housing first.** Housing is the largest household debt, so homes on community land trusts belong early in the build-out.
3. **Watch private credit.** Regulators should track its exposure to the sectors where AI cuts revenue fastest, starting with software sold per seat.

The fiscal problem

Most federal revenue comes from taxing labor. If wages fall, receipts fall exactly when spending on the bridge rises. That's the strongest argument for moving the tax base toward capital and rents early, and for a formula whose surcharge pauses automatically in a demand shortfall (Section 16).

The dashboard

Every switch and gate depends on measurement, so the paper proposes a public dashboard. A signpost is a number we can check, like a mile marker; a trigger is a rule decided in advance

about what happens when it crosses a line. Thresholds here are illustrative; real ones would be set in law.

Indicator	Source	Illustrative trigger	Response
Employment gap for young workers in AI-exposed jobs	Stanford Digital Economy Lab	Gap above 25%	Expand apprenticeships; open the Stage 2 gate
Long-term unemployment and median wages	Bureau of Labor Statistics	Both worse for two quarters	Switch B
Entry-level hiring and starting wages in AI-exposed occupations	Stanford Digital Economy Lab; payroll and job-posting data	Both falling for two quarters	Switch B
Labor's share of income	Bureau of Labor Statistics	Down more than 3 points in 3 years	Switch C
AI revenue as a share of the knowledge-work wage bill	Company filings and industry estimates	Above a set share	Open the Stage 2 gate
Prices of essentials versus overall inflation	Consumer Price Index	Essentials rising faster for two quarters	Read as a supply shortage: build and provide in kind
Federal receipts versus forecast	Congressional Budget Office	Shortfall beyond a set percentage	Accelerate the tax-base shift
Long-term real interest rates	Treasury inflation-protected securities	A sustained rise	Markets expect explosive growth: check every forecast
Capability dial	If-then commitments	A new dangerous capability appears	The response its commitment names in advance
Concentration dial	Shares of frontier compute and the robot fleet held by the top few	Rising	Speed compute cooperatives and the gift-back
Coordination (part of the concentration dial)	Benchmarks of how output scales with the number of identical AI copies at fixed compute per copy; firms' payroll against AI spending	Output starts scaling faster than linearly with team size (exponent above 1)	Speed shared ownership of deep-market production under the utility rule (Core design)
Stock signposts	Resource accounts	Aquifer levels, soil carbon, the recycled share of metals, energy per tonne of ore heading the wrong way	Tighten the stock rule; point machines at substitutes

Three dials track the big picture: wages, capability, and concentration. If-then commitments, in Holden Karnofsky's words, don't require "agreement on whether major AI risks are imminent",

which is why they suit a design that bets on triggers, not predictions. A sudden shortening of METR's measured doubling time for the length of tasks AI can complete, which ran about seven months for six years, would be "foom," a sudden runaway jump in capability, showing up in the data.

The concentration dial includes coordination: if multi-agent output starts scaling superlinearly, the deep markets can tip into one firm, so the response is to put shared ownership in place before they do. Imas, Koh, and Legg ask for exactly these measurements: coordination benchmarks and "tracking both payroll and compute spending".

16. Compute, personal machine intelligence, remix, and the tax plan

Local ownership of machines solves only part of the ownership problem. The most valuable capital of the coming decades may be frontier AI itself, which no town can build. This section covers who owns intelligence, how creators get paid in a world of remix, and how the transition is paid for.

The risk: intelligence concentrates

Dwarkesh Patel argues that once models learn on the job, continual learning will give leading labs a moat: a model that has learned your business is costly to replace. Luke Drago and Rudolf Laine describe the deeper danger as an "intelligence curse": like rulers of oil states, those who control AI may lose any incentive to invest in people. Their prescription is to avert catastrophe without centralizing, diffuse AI that augments people, and democratize institutions.

If towns own their robots but rent their intelligence from two or three labs, the labs hold the switch this design says nobody should hold.

Industrial AI and consumer AI

Industrial AI is the power plant; consumer AI is the appliance. Frontier models can stay industrial: declared, inspected, and taxed for their rents. The appliance in your home should be yours.

That's the case for owned personal machine intelligence, and it rests on incentives, not villains. If a company hosts your companion, it decides what it will and won't do for you, when it's available, and what it charges for the privilege. Create those incentives and that's how the decisions get made.

Centralized AI is safe by control: the fortress. Local AI is safe by many roots: the forest, harder to oversee but much harder to capture. This design plants the forest, with three protections:

- **Local by default, cloud on request.** Your companion runs on your own machine unless you choose otherwise.
- **Memory portability.** What a model learns about you, your party, or your guild belongs to you and moves with you to another provider. That turns continual learning's lock-in into the customer's asset.
- **AI-conversation privilege.** What you tell your own machine should be protected the way what you tell a lawyer or therapist is, with the same exception for conversations used to plan a crime or fraud (*United States v. Zolin*). That takes a new statute: courts can recognize new privileges, but in 2026 rulings, AI chats were treated as ordinary records (*US v. Heppner*). Keeping the companion on your own hardware also keeps those records off a company's servers. Home robots answer to their owners.

Compute cooperatives and frontier rents

1. **Compute cooperatives.** Regional cooperatives, owned through the federation, run inference hardware and open-weight models for their towns, the way rural electric co-ops formed shared generation co-ops. Most tasks don't need the frontier; they need dependable, owned capacity.
2. **A national claim on frontier rents.** Where frontier capabilities are scarce, the public claims a share. *AI 2040: Plan A* proposes auctioning permits for compute and robots and paying the proceeds to citizens. This design adopts the auction but pays the proceeds into community investment funds that build towns' infrastructure and compute cooperatives, not checks.
3. **Safety without centralization.** Verification, auditing, and incident reporting should be built so open and cooperative providers can meet them, not only the largest labs. A steering wheel doesn't replace the brakes; every car has both. The frontier can be declared and inspected. The everyday fleet should be owned.
4. **Fund new architectures.** Public research money for alternatives to today's scaling path keeps the field from narrowing to whoever owns the biggest data centers.

Rails for an economy of AI agents

Google DeepMind researchers argue that an economy of AI agents is already emerging by accident, and that the key design choice is permeability: how freely value moves between the agent economy and the human one. This design is deliberately semi-permeable. Goods move freely between towns, but dispatch rights and need-based credits can't be converted to dollars, which shuts out speculation and flash-crash dynamics. Proof-of-personhood checks make sure each person gets exactly one share.

Commanding heights we haven't claimed yet

Will Manidis and Joe Roberts argue in *The Commanding Heights* (October 2026) that as models commoditize, durable value goes to the scarce positions intelligence has to pass through: "In the world to come, one either owns the rails or pays those who do." This paper claims the physical heights: water, power, fabs, the grid backbone, and the fleet. Four digital ones are still open.

Height	Why it's a chokepoint	Position
Payments and money rails	Inter-town settlement, the federation's market, and the cash floor all run on someone's rails. Manidis and Roberts expect a global stablecoin dollar whose channel owners "collect a toll that rises with inflation"	Common carrier with open, non-discriminatory access, the Order No. 888 rule applied to payments. Open settlement protocols between towns. Dispatch rights and need-based credits stay non-convertible (above)
Identity	Proof of personhood decides who gets one share and one vote	An open credential protocol with many issuers, held by the person, never a single platform. The registry layer is essential infrastructure, so it's owned in common by the federations or run as a public utility
Distribution, between the model and the user	Intelligence "must ride rails owned by someone, a distribution network." Whoever sits in that channel can steer both sides	Common carrier: no self-preferencing. Open protocols for agents and parties (Section 7), with the local-by-default companion and memory portability (above)
Communications and orbit	Manidis and Roberts note that dollars now travel "by undersea cables" and satellite. A town whose links run through one provider has a single switch	Last-mile networks are town infrastructure, owned the way rural electric co-ops own their lines. Backbone, cables, and satellite links run as common carriers, with essentials required to use more than one provider, so no single vendor can switch a town off

One rule covers all four: **run it as a common carrier, prefer an open protocol to a platform, and where it's essential infrastructure, own it in common**, through the trusts and the federation, or regulate it as a utility where common ownership isn't practical.

Remix and provenance

Large language models are "large remix models". Remix kills the value of the copy, not the creator. So pay the chain:

- **Provenance by default.** Every output carries a record of what it drew on.
- **A standard remix license.** A compulsory license, like the one that lets anyone record a cover song for a set fee, so permission never becomes a chokepoint.
- **Guild collecting bodies** that gather and pay out royalties, the way music's performing-rights organizations have done legally for decades (Section 9).

Datasets are funds on the resource accounts, maintained and credited like any other. Don't fence the idea; pay the person.

The tax plan

The tax plan has two parts: a path that shifts the base from labor to rents and capital, and a formula that sets the rate every year. It adopts the formula from the flat-tax white paper *One Rate, One Formula, One Direction*:

> **Rate = spending ÷ tax base + a debt surcharge.**

It's set by statute every year, so every spending bill shows up on next year's paycheck. One rate replaces the income and payroll taxes, a three-fifths vote locks the formula in, and CBO and the Joint Committee on Taxation model the numbers first. This plan makes **four changes and a gentler surcharge schedule:**

1. **One formula, two rates.** Capital income pays 8 points more than labor income. Gains are taxed at sale or at death, above an exemption; step-up basis ends, which Penn Wharton estimates raises the revenue-maximizing capital gains rate from 33% to 42%. There's no tax on unrealized gains (*Moore*).
2. **Hiring is never taxed more than automating.** Wages stay deductible, as they are today. The change is that there's no employer payroll tax and machines get no faster write-off than people, so a worker and a robot are treated alike.
3. **Downturns don't raise rates.** The formula uses the trend tax base, not last year's.
4. **The surcharge pauses on data, not a vote,** whenever the dashboard shows a demand shortfall.

The gentler surcharge: 4 points while debt is above 60% of GDP, 2 points above 30%, and zero after. That reaches 30% in about 16 years, roughly where debt stood in 2001 (33.1% of GDP). Every surcharge dollar retires principal.

What the evidence says about rates

Four findings shape the rates:

- **Labor is overtaxed relative to machines.** Daron Acemoglu, Andrea Manera, and Pascual Restrepo find effective US labor taxes of 25.5% to 33.5%, while equipment and software faced about 5% after tax laws from 2002 through 2017. Their baseline optimum is 18.22% on labor and 26.65% on capital; a Brookings summary of an alternative specification puts it at 9% and 22%. Either way, labor should pay less than capital.
- **Moving to the optimum raises employment.** In their model, by 4.02%. If full reform isn't feasible, a second-best automation tax of about 10% helps.

- **A robot tax is a transition tool.** Guerreiro, Rebelo, and Teles find it's optimal only while today's routine workers are still in the labor force, and zero once they retire.
- **It should be small, and shrink.** Costinot and Werning put the efficient robot tax at about 1% to 3.7% in one version and 3.78% to 6.42% in a later one, declining as technology improves.

So the plan follows the formula, splits it toward the optimum, and adds one transition tool:

- **A low rate on labor income and a higher one on capital income,** 8 points apart.
- **No payroll tax and equal write-offs,** so hiring is never costlier than automating.
- **A transition automation levy** in Costinot and Werning's range, on spending on machines that replace routine work. Its revenue lowers the labor rate, and it phases out as displaced cohorts retire.
- **The cash floor, phased in.**

The arithmetic

The starting point is CBO's actual fiscal 2026: outlays of $7.396 trillion against receipts of $5.403 trillion, a $2.0 trillion deficit. Debt is about 101% of GDP. On the plan's broad base of about $28 trillion, each point of rate raises about $280 billion. That base is all income, taxed once with nothing excluded: personal income of about $26.3 trillion in 2025 (wages, benefits, interest, dividends, rent, and business income), plus about $1.4 trillion of realized capital gains, or about $27.8 trillion. That's an upper bound, since personal income counts some in-kind and imputed items.

- **Spending:** $7.4 trillion ÷ $28 trillion ≈ **26.4 points.**
- **The cash floor at full size:** about $1.4 trillion ≈ **5 points.** That's $4,800 for each of about 269 million adults plus $1,700 for each of about 72 million children (Census Bureau 2025 estimates). In year one it costs what the programs it consolidates already cost, which today's spending already includes, so it adds nothing.
- **The surcharge:** with debt above 60% of GDP, **4 points.**

To split a blended rate into two, I use the base's own mix. Compensation of employees was $15.7 trillion in 2025, about 56% of the base. Capital income (interest, dividends, rent, and realized gains) is about a quarter, and part of business income is capital too. So assume about 70% of the base pays the labor rate, benefits included, and 30% pays the capital rate. With capital paying 8 points more, the labor rate is the blended rate minus about 2.4 points.

The formula also nets out revenue that stays outside the one rate. Customs duties brought in $172 billion in fiscal 2026, about 0.6 points. Excise taxes would lower the rate a little further.

Point on the path	Spending	Customs	Cash floor (new)	Surcharge	Blended rate	Labor rate	Capital rate
Year one	26.4	−0.6	0	4	**29.8%**	27.4%	35.4%
Floor at full size, debt above 60%	26.4	−0.6	5.0	4	**34.8%**	32.4%	40.4%
Floor at full size, debt 30–60%	26.4	−0.6	5.0	2	**32.8%**	30.4%	38.4%
Floor at full size, debt below 30%	26.4	−0.6	5.0	0	**30.8%**	28.4%	36.4%

The second row is the plan's opening position: an opening rate of about 34 to 35%, the formula's output rather than a top bracket (today's top bracket is 37%), with capital paying about 40%.

The table overstates the floor, though, because at full size it replaces programs whose cost is already in today's spending. The last full count is old: the Congressional Research Service identified 83 overlapping low-income programs that cost $746 billion in federal funds in fiscal 2011, much of it Medicaid, which stays in kind. The cash floor would replace the cash-like programs among them, so the real addition is $1.4 trillion minus their current cost. CBO needs a current count before the rate is set.

Every year count here needs CBO and Joint Committee on Taxation modeling before it's relied on.

Getting from about 30% to 19%

My original path was 30% in year one, stepping down about a point a year to a floor near 19%, with 15% as the goal. Year one lines up almost exactly: the formula opens at about 29.8%.

The step-down comes from four levers, because the formula can't fall faster than spending falls relative to the base:

1. **Growth.** If spending holds steady in real terms, a 19% rate needs a base of about $38 trillion, 35% larger than today. At CBO's projected 1.8% a year, that takes about 17 years. At 3% it takes about 10, and at 4% about 8. Machine labor is the case for the faster numbers. A 15% rate needs a base of about $48 trillion. These are simple compounding illustrations, not forecasts.
2. **The essentials moving in kind.** As towns provide the lifeline block, federal programs and the cash floor shrink, and spending falls with them.
3. **The surcharge stepping down,** from 4 points to 2 to zero as debt falls.
4. **Spending reforms.** Paying Medicare Advantage plans at parity with traditional Medicare would save much of the $84 billion a year MedPAC estimates they're overpaid. Site-neutral payment for hospital services would save Medicare roughly $100 billion to $140 billion over ten years, by CBO's estimates. Together that's about a third of a point. Spending early (birth to five) and Housing First add more, but plan on realized savings, not scored ones.

At 19%, the same split puts labor near 17% and capital near 25%, inside the range the evidence calls optimal. So the honest comparison: the 30% start holds. The full step-down to 19% arrives sometime between the mid-2030s and the mid-2040s, depending on growth and how fast essentials move in kind, rather than a point a year from year one. The automation levy can speed it, since each $280 billion it raises takes a point off.

The path, and where it ends

The tax path has three steps:

1. **Reinvest the growth** through community investment funds that build towns' infrastructure and give it back.
2. **Shift the base** from labor to rents and capital. Natural-resource rents are only about 5% of income (Trammell and Patel), so the income tax stays through the transition, with capital paying more. Land-value taxes belong to states and cities; the federal tools are resource excises, federal-land royalties, spectrum and compute-permit auctions, and a large-estate tax.
3. **Let the base shrink** to land, luxury, and status goods, as the essentials move in kind.

Capital moves, so coordinate. Trammell and Patel argue a global progressive capital tax is essentially the only way to keep inequality from growing extreme under full automation; the 15% global minimum tax on large multinationals shows coordination is possible. It's a weak precedent, though: a corporate floor far below the capital rates here, and since a January 2026 package, US-parented groups can opt out of its main enforcement rules. That's why the tax path leans on what can't leave. Business income is taxed where customers are, not where a company books its profits: the destination principle Alan Auerbach, Michael Devereux, Michael Keen, and John Vella set out for exactly this problem (2017). More of the base comes from things fixed in place: land and resource rents, spectrum, federal-land royalties, and permits for scarce compute in data centers built here. And people who renounce citizenship pay tax on their gains on the way out, as the US already requires of wealthy expatriates (§877A). A spending cap belongs only alongside universal basic capital, so a cap never shrinks the floor.

The floor isn't a tax rate. It's a design.

Who this could leave behind

Poorer countries. The IMF estimates that about 40% of global employment is exposed to AI: around 60% in advanced economies and 26% in low-income countries, which have less exposure but less capacity to benefit. Imas warns that commodity exporters face a more worrying outlook. The design is exportable: open standards for resource accounts, international compute cooperatives, and a share of frontier rents directed abroad are the levers.

Women and men, differently. Brynjolfsson and coauthors find women more exposed in their data, while Imas notes that the jobs likely to survive, in care and relationships, skew female, and the most automatable skew male. Guilds address both: they give care work recognition it has rarely had, and they open paths into relational and craft work for people displaced from jobs machines take over.

17. Conclusion

Money isn't the problem; seeing the physical economy only through money is. The first draft tried to fix that by replacing money with energy. This paper keeps money and adds what it lacks: a second ledger that shows what each community has, makes, uses, and loses, so abundance can actually reach people.

The economics literature agrees that if machines do the bottleneck work, ownership decides who benefits. This paper's answer is universal basic goods and services, powered by universal machine labor on demand, distributed by universal basic capital.

Everyone owns a share of the systems that make their floor of goods and services, a share that can't be sold and moves with them. Everyone can call on the machines for whatever they choose to build, as a right of their own, not a payout of the share. And everyone keeps the right to do any work they choose: if a human wants to do it, a human gets to do it.

No single owner holds it all. Trusts hold what's tied to a place, guilds hold their crafts, parties hold what they build, and people own their own machines. The floor and the capital back each other up, and they grow together.

Capital and labor were enemies. Safety and freedom are twins.

It starts simple: equal shares, a free first block, machines on the essential systems, maintenance before dividends, and an eight-commitment charter. Everything else earns its place in pilots or doesn't get built.

The pieces already exist. Communities have governed commons for centuries under Ostrom's rules. Electric cooperatives have owned their wires since the 1930s. Food banks allocate by need with a made-up currency. The acid rain program measured every smokestack and cut pollution by nearly two-thirds. What's missing is assembling them, piloting them, and publishing the results honestly.

Doomers want a brake. Accelerationists want a gas pedal. Worldbuilders want a steering wheel. This paper is a steering wheel. The next system gets written within a decade, and whoever has working prototypes writes the rules.

That's the next step: one pilot pair, one set of accounts, and two to three years to see whether it works.

The floor frees people for what no machine replaces in us: curiosity and care (service). After that, growth turns outward. A floor for everyone, a frontier for anyone.

Sources

Sources are grouped by topic. A companion essay series, *The World We Want*, makes the same case in plain language.

The economics of AGI

- Jacobs and Imas, *Economic Policy for AGI*, Google DeepMind (2026)
- Imas, What will be scarce? (2026)
- Restrepo, We Won't Be Missed, NBER (2025)
- Trammell and Korinek, Economic Growth under Transformative AI, NBER
- Trammell and Patel, Capital in the 22nd Century (2025)
- Korinek and Suh, Scenarios for the Transition to AGI, NBER (2024)
- Acemoglu, The Simple Macroeconomics of AI (2024)
- Epoch AI, GATE (2025)
- Patel, Why I don't think AGI is right around the corner (2025) and 8 Predictions for the Era of Continual Learning (2026)
- Drago and Laine, Breaking the Intelligence Curse (2025)
- Tomašev and coauthors, Virtual Agent Economies (2025)
- Catalini and Hui, Some Simple Economics of AGI (2026)
- Citrini Research, The 2028 Global Intelligence Crisis (2026), and Citadel Securities' rebuttal
- Yale Budget Lab, AI Is Probably Not (Yet) the Reason for Labor Market Weakening (2026)
- Brynjolfsson, Chandar, and Chen, Canaries in the Coal Mine?, August 2026 update; AI economic indicators
- Chow, Halperin, and Mazlish, Transformative AI, existential risk, and real interest rates
- OpenResearch, Unconditional Cash Study (2024)
- AI Futures Project, AI 2040: Plan A (PDF) (2026)
- Android Dreams (2025)
- Mostaque, *The Last Economy*: Chapter 14, Chapter 18, One Year On; Intelligent Internet, Champions thesis and whitepaper

- Pew Research Center, AI and its impact (2025) and 2026 update
- Bureau of Labor Statistics, labor share at 52.8% (2026)
- Karnofsky, If-then commitments for AI risk reduction (2024); METR, Measuring AI ability to complete long tasks (2025)
- Imas, Koh, and Legg, *Organizing Intelligence*, Google DeepMind working paper (2026), and the companion essay *The Economics of Intelligence* (2026)
- Manidis and Roberts, *The Commanding Heights* (2026)

Ownership, governance, and organization

- Ostrom, Design Principles of Robust Property Rights Institutions (2009)
- Madison, Federalist No. 10; the Pullman Strike
- FERC, Order No. 888 (1996) and Order No. 2222 (2020)
- America's Electric Cooperatives, NRECA; University of Wisconsin, Rural electric cooperatives
- Irvine Ranch Water District, water budget formula; California Public Utilities Commission, Medical Baseline; Grounded Solutions Network, 2011 model ground lease; FHWA, P3 handback experience
- Carnegie libraries; East India Company, 1911 *Britannica*
- Coase, The Nature of the Firm (1937); Baran, On Distributed Communications (1964)
- Gallup, Americans' views of big and small business (2025)
- RFC 5321; Masnick, Protocols, Not Platforms (2019); TradeLens
- Harvey, Building the Economic System That Takes Us Past AGI (2025)
- Council of Europe, Ireland's Citizens' Assembly
- Laws of robotics; EU AI Act, Article 50

Money, prices, and the ledger

- Bank for International Settlements, 2025 Triennial Survey; WTO, Global Trade Outlook 2025
- Federal Register, reserve requirements reduced to zero (2020)
- EPA social cost of carbon, 2023 report summary
- UN, SEEA Central Framework and 2021 global assessment
- FERC, electric power markets; ISO New England, locational marginal pricing; CPUC, Lifeline Act decision; CBS News, Griddy files for bankruptcy
- Works in Progress, How market design can feed the poor
- Prendergast, The Allocation of Food to Food Banks, draft (2016)

- USGS, 2025 critical minerals list; European Commission, battery passport; Sanctum, Solana speed guide
- Ayres, The second law, the fourth law, recycling and limits to growth (1999); IIASA, Decent living for all (2020)
- AI Impacts, the Good Judgment Project; Startupticker, Tinamu and Cotecna
- Bullwhip: the Beer Game; Stanford GSB, Whang and Lee; Lee, Padmanabhan, and Whang, The Bullwhip Effect in Supply Chains (1997); Supermarket News, Walmart's CPFR pilot (1997)

History

- Technocracy movement; American Heritage, Howard Scott
- Mises Institute, the Wörgl experiment; Project Cybersyn
- EPA, Acid Rain Program 2009 highlights; European Commission, EU ETS emissions down 50%
- swissinfo, WIR; Stodder and Lietaer, WIR-Bank credits; Mondragon
- Perez, *Technological Revolutions and Financial Capital* (2002)

Systems and limits

- Meadows, Leverage Points (1999) and *The Limits to Growth* (1972)
- Herrington, Update to limits to growth, *Journal of Industrial Ecology* (2021)
- Daly, "Toward some operational principles of sustainable development", *Ecological Economics* (1990)
- Jevons, *The Coal Question*, ch. VII (1865); Goldratt, *The Goal* (1984), via "Theory of constraints"; Sprengel and Liebig, "Law of the minimum"
- IEA, *The Role of Critical Minerals in Clean Energy Transitions* (2021): mines took "over 16 years" on average from discovery to first output
- Rand et al., *Queued Up: 2026 Edition*, Berkeley Lab; IEA, *Energy and AI* (2025)
- International Aluminium Institute, aluminium recycling; Royal Society, *Ammonia* (2020)
- DOE Office of Science, *Basic Research Needs for Solar Energy Utilization* (2005)

Law

- *United States v. Butler*; *Helvering v. Davis*; *Printz v. United States*; the 16th Amendment; *Moore v. United States*
- *Avery v. Midland County*; *Zobel v. Williams*; *Saenz v. Roe*; *Goldfarb v. Virginia State Bar*; *BMI v. CBS*
- Pomerantz, The CLARITY Act; Arch, GENIUS Act vs CLARITY Act; Congress.gov, H.R. 3633 actions; Coin World, the Liberty Dollar verdict

- *Salyer Land Co. v. Tulare Lake Basin Water Storage District*; *Ball v. James*; *South Dakota v. Dole*; *United Housing Foundation v. Forman*; *United States v. Zolin*
- Orrick, *United States v. Heppner* (2026); Cornell LII, 26 U.S.C. §877A; Tri-State, Form 8-K on United Power's withdrawal (2024)

Fiscal policy and taxes

- CBO, Monthly Budget Review for fiscal 2026 and The Budget and Economic Outlook: 2026 to 2036
- BEA via FRED, compensation of employees and personal income; Tax Foundation, capital gains collections; Census Bureau, population estimates
- Senate Budget Committee, CRS report on low-income programs
- HHS ASPE, 2026 poverty guidelines; OMB, historical debt
- Acemoglu, Manera, and Restrepo, Does the US Tax Code Favor Automation? (2020), and the Brookings summary
- Guerreiro, Rebelo, and Teles, Should Robots Be Taxed? (2022); Costinot and Werning, Robots, Trade, and Luddism
- Penn Wharton Budget Model, revenue-maximizing capital gains rate
- MedPAC, March 2025 report; Medicare Rights Center, site-neutral payment
- Hoynes and Rothstein, Universal Basic Income in the US and Advanced Countries, NBER (2019)
- Auerbach, Devereux, Keen, and Vella, Destination-Based Cash Flow Taxation, Oxford University Centre for Business Taxation (2017); Baker McKenzie, Pillar Two side-by-side package (2026)
- IRS, Economic Impact Payments: a message from the Commissioner (2020)

Appendix A: what the first draft got wrong

Of the 14 checkable claims below, 1 held up, 10 were wrong, overstated, or outdated, and 3 were unsourced or hypothetical. Figures marked approximate come from standard reference values.

First-draft claim	Verdict	Corrected figure or note	Source
FX $7.5T a day vs goods $50B a day: "150:1 speculation to production"	Partly wrong	FX was $9.6T a day in April 2025; goods about $67B a day; ratio about 140:1, but most FX is funding, hedging, and dealer trading	BIS, WTO

First-draft claim	Verdict	Corrected figure or note	Source
A bank keeps 10% reserves and turns $10,000 into $100,000	Outdated	US reserve requirements have been zero since March 26, 2020; loans create deposits	Federal Register
A barrel of oil causes about $200 of carbon damage	Overstated about 2.5x	About 0.43 t CO2 per barrel (approximate) × EPA's $190/t ≈ $80	EPA via ELR
Lumber: $1,686 in May 2021, $450 in November 2021, same supply	Partly wrong	Lumber futures peaked at $1,711.20 in May 2021, fell to $448 by August, and were back above $1,000 by December; supply and demand both shifted	Barchart
"GPT-4 processes 100 trillion tokens"	Wrong	OpenAI hasn't disclosed it; the reported training set was about 13T tokens; "100 trillion" was a debunked parameter rumor	The Algorithmic Bridge
Blockchains handle "billions of transactions a day"; Solana 65K TPS	Overstated	Solana's real non-vote throughput is about 1,000–4,000 TPS	Sanctum
Stablecoins: "$150 billion+ in circulation"	Outdated	About $306B at the end of 2025	Stablecoin Insider
Unemployment 10% (2030), 40%, 70%, 90% (2045)	Unsourced	Withdrawn; replaced with published scenarios (Android Dreams; AI 2040: Plan A)	AI 2040, Android Dreams
Tinamu: 95%+ accuracy, hourly updates, 1/10 the cost	Partly unsupported	Published pilot: up to 50x faster reports; no cost figure found	Startupticker
"Solar at 1% efficiency = 100x current use"	Garbled	Capturing about 1% of the ~173,000 TW of sunlight reaching Earth ≈ 1,700 TW, roughly 90x human energy use of ~19 TW (approximate)	Energy Institute, via Our World in Data for human use; standard reference values for sunlight
"Impossible to have speculative bubbles"	Wrong	Real goods bubble too; the tulip mania traded real bulbs	General history
AI vision "solves" the oracle problem; fraud "nearly impossible"	Overstated	Vision models err and can be fooled; this design uses layered verification	Section 3
Named-company futures, "Year 1–4 outcomes," 10M participants by 2030	Hypothetical	Cut; stages now advance on triggers	Section 10
Human energy use about 18 TW; solar influx about 173,000 TW	Roughly right	About 19 TW in recent years (approximate)	Energy Institute, via Our World in Data for human use; standard reference values for sunlight

Appendix B: data standard

A resource account entry is a signed record of a physical fact, not a tradable unit. The format is illustrative; a real standard would build on the SEEA's definitions and existing metering and product-identification standards.

```
{
  "entry_id": "ridgeview/2027-03-14/energy/0412",
  "town": "ridgeview",
  "facility": "ridgeview-solar-array-2",
  "class": "electricity.solar.unstored",
  "term": "production",
  "quantity": 1840.5,
  "unit": "kWh",
  "period": { "start": "2027-03-14T00:00:00Z", "end": "2027-03-15T00:00:00Z
  "lapses_at": "2027-03-15T00:00:00Z",
  "measurement": {
    "device": "meter-RV-2-0007",
    "method": "revenue-grade meter",
    "signature": "<device signature>"
  },
  "checks": {
    "identity_balanced": true,
    "plausibility": "within 4% of irradiance-based estimate",
    "last_physical_audit": "2027-02-02"
  },
  "visibility": "town"
}
```

Field	Purpose
`class`, `unit`	Which resource, in which unit (Section 3)
`term`	Which term of the accounting identity: production, import, consumption, export, loss, or stock count
`period`, `lapses_at`	When the flow happened, and when a perishable entry expires
`measurement`	The device that measured it and its signature
`checks`	Results of the identity, plausibility, and audit layers
`visibility`	Who can see it: household, town, network, or public

Three properties matter more than the exact fields:

1. **Append-only.** Entries are never edited. A correction is a new entry that references the old one.

2. **Facility-level.** There's no person field. Household readings stay in the household's own system and reach the town only as totals.
3. **Portable.** A town that leaves the network takes its entries with it, in an open format any system can read.

Appendix C: worked example, one month in a pilot pair

All names and numbers are invented. Two neighboring towns form a pilot pair: **Ridgeview**, a farm valley of 3,000 people with good soil and modest sun, and **Dry Creek**, a desert town of 2,500 with abundant sun and little water.

Step 1: the accounts close the month

Ridgeview's March accounts, by the identity in Section 3:

Class	Production	Imports	Consumption	Exports	Losses	Stock change
Electricity (MWh)	620	140	730	0	30	0
Water (thousand m³)	95	0	71	0	14	+10
Grain (tonnes)	0 (off-season)	0	60	40	2	−102
Fresh produce (tonnes)	85	0	70	0	15	0

Water losses of 14,000 m^3 are about 15% of production, well above the town's 8% tolerance, so the account flags it. Fresh produce losses are 18%, also high.

Step 2: the flags become fixes

The water flag leads to a failed main under an orchard. The produce flag shows losses clustering in the two days after each harvest, before cold storage frees up. Neither problem was visible before the accounts existed; both go on the maintenance list, which comes first in the use of revenue.

Step 3: surplus moves between the towns

Ridgeview has stored grain to spare and is short of evening electricity. Dry Creek has the reverse. Each posts its surplus to the regional market the federation runs. Dry Creek buys 40 tonnes of grain, and Ridgeview buys 140 MWh of stored evening electricity, at locational prices. The federation nets the two trades on the towns' trade accounts, so only the difference changes hands in dollars. Households in both towns never see those prices; they sit behind the lifeline block.

If Dry Creek had nothing to sell and couldn't cover the difference, it would bid need-based credits for grain from the federation's reserve (Appendix F). Here the trade nets out, so credits stay on the shelf.

Step 4: the future gets a forecast

The region asks: "Will Dry Creek's aquifer fall below its management threshold before 2030?" Public forecasts and the resource accounts put it at about 35%. That moves a water-recycling plant for Dry Creek up the regional build-out list.

Step 5: a shock hits the reserve

In July, a hailstorm destroys a third of Ridgeview's produce. Ridgeview draws six weeks of fresh produce from the federation's shared reserve and replenishes it over the next two seasons. No household goes without, and nobody pays a price spike, because the floor was never priced.

Step 6: an ordinary Tuesday

In Ridgeview, the bakers' guild, which bakes in the town bakery with the flour and oven time its bread draws, posts that six members will bake today. The dispatch system parks two of the bakery's four machines and sends their hours to the cannery, which no one signed up for.

A party of eleven residents restoring the creek calls for excavators and planting robots. Open dispatch finds idle machines: two of the trust's excavators and a planting robot the landscaping guild isn't using this week. The request is filled from tier 3, in the order received, with no fee for machine time. The machines' wear meters log the job against the eleven members' allowances, and the maintenance budget covers the wear, so lending costs the guild nothing. The party pays only for the extra diesel and materials beyond its members' blocks.

A retired electrician spends the morning checking the robots' wiring for the verification guild, a role the guild keeps human on purpose. Everyone else uses their personal machines for whatever they like. Everyone eats, has power, and can see a doctor, whether or not they did any of this.

Step 7: a heat wave

In August, a heat wave pushes Ridgeview's evening electricity demand past the limit written into its charter. The conservation flag switches on automatically. Requests follow the tiers: cooling for homes and the clinic first, then the community's voted projects, and the reserved share for quests is suspended for the duration.

One resident runs a power-hungry compute job through the peak, and the trust's elected board asks about it. It turns out to be the clinic's imaging backlog, run as a volunteer favor, so it

continues. Three days later, supply recovers, the flag lifts on its own, and the creek party's excavators start again.

Appendix D: glossary

Term	Meaning in this paper
Accounting identity	Stock change = production + imports − consumption − exports − losses; the check every account must pass
Build order; dispatch order	The dispatch order (three tiers) decides how today's machine labor is used; the build order (six steps, Section 2) decides where new capacity goes. Run the floor first; build the flywheel next
Call for aid	A quest's open request for partners, sent first to the local network, then the region, then guilds and talent networks worldwide
Cash floor	A universal monthly payment, $4,800 per adult and $1,700 per child a year at full size, recovered by the one tax rate as income rises, with no separate phase-out; phased in, and the end state of the cash path
Community investment funds	One pipe for public money into towns: growth dividends and permit proceeds that build infrastructure and give it back, not checks
Community land trust	A nonprofit holds the land, and homes sit on long, renewable ground leases (typically 99 years) and resell at a formula price, so they stay affordable
Companion	Your personal machine intelligence: it knows you, holds your memory, and runs on your own machine unless you choose otherwise
Compute cooperative	A member-owned provider of computing power and open-weight models, owned through the federation
Conservation flag	A temporary shortage measure that switches on automatically when resource data crosses limits in the charter: essentials first, the quest reserve suspended, lifts on its own
Curiosity and care (service)	The two drives no machine replaces in us, and the meaning the floor frees people for
Daily throttle	Scheduling machines around human choices in human-optional domains: people first, machines fill the rest
Data Foundry	A workshop where people practice skills and are paid a session rate for recordings they own together, plus a dividend for the life of any model trained on them; the one consented exception to measuring flows, not people
Dispatch rights	Everyone's equal right to call on machine labor, distributed by demand in three tiers; a right held by the person, not a payout of the share; never sold or converted to dollars
Essentials	The seven organizing categories of the floor: food, water (including sanitation), energy, housing, healthcare, transport, and communication (including education)
Exergy	The part of energy that can still do useful work; what actually gets used up
Factory factory	A gigafactory built to make microfactories, so a few big plants equip many small, local ones

Term	Meaning in this paper
Federation of town trusts	The trusts' regional cooperative: it holds the regional half of every share, owns regional plants, pools the essentials too big for one town, and runs the market between towns without owning any town's infrastructure
Floor	Universal basic goods and services: everything reasonable that's available today, free in a lifeline block, plus personal machine intelligence and labor
Flow; fund	A flow is used up in production (fuel, feedstock); a fund serves over time if maintained (soil, machines, buildings)
Foom	A sudden, runaway jump in AI capability; the capability dial watches for it
Four owners, no sovereign	Four kinds of owner, so no single one is in charge: the trusts (town and federation) hold places, guilds their craft, parties their quests, and people their own machines
Gift-back	Transfer of infrastructure to residents under a build-operate-transfer contract: a capped return earned on output, a fixed handover date, and part of the return held back until the assets pass a condition check; agreed up front and never compelled
Guild	People grouped by craft, open to any apprentice; train, certify, and collect, but never fix prices
Handover	The shift between economic systems: Stages 1 and 2, intelligence on demand and then machine labor on demand
Human-will rule	If a human wants to do it, a human gets to do it; machines fill the rest
Leagues	Ranked competition a guild runs in its craft; promotion earns harder opponents and bigger quests, never more machines
Lifeline block	Each household's free first block of every essential: a base for the home plus an equal amount per resident, free at all times; use above it is priced at what the extra use costs the town, and anything made for sale pays those same rates from the first unit
Machine labor on demand	Machine intelligence plus robots, callable for any job; parts, energy, and intelligence in, labor out; built to peak demand
Machine-guaranteed and human-optional domains	Essential systems machines always run, versus work people can safely take on first
Maintenance-first rule	Revenue pays for upkeep first, budgeted from metered wear, then expansion, then dividends
Maximum safety	Machine intelligence built around six laws, from Asimov's four to never impersonating a human and the human-will law, enforced in layers
Minimal charter	The eight commitments every town trust makes; everything else is local choice
Need-based credits	A fallback unit issued by need, spent only in the federation's reserve auctions when a town has nothing to sell; fully recirculated; never traded between towns or cashed out
Negative income tax	A payment that shrinks as earnings rise; the cash floor takes this form, and Switch B moves it to full size early
Node states	The rollout's fifth stage: towns self-sufficient enough to trade surplus freely, with self-sufficiency regional at the limit

Term	Meaning in this paper
Open party protocol	Shared rules anyone can use to form parties, so no platform collects rent on quests
Party; quest; single-use company	A quest is one goal with an end; a party forms to finish it and disbands; legally, a single-use company
Personal machine	Each person's owned machine intelligence and machine labor, linked; the base of universal basic machine labor. Nobody else can call it unless you lend it, since it holds your memory and lives in your home
Phases	Scarcity (now), transition (to the early 2040s), and abundance
Pilot pair	Two towns, one with spare food and one with spare energy, 1,000 to 5,000 people each, testing the design together
Resource account	A town's live record of what it physically has, makes, uses, and loses: the second ledger beside money
Resources follow use	How floor services are equipped: anyone who wants to provide one gets the machine time and materials to start, and more flows to whoever's output residents actually use, measured at the facility; the trust never pays guilds, and dollars come only as thanks
Scale the makers, localize the made	Build the few plants physics says must be big once, regionally, as utilities; make everything else small and run it locally
Scarcity flywheel	Better materials make better chips, batteries, solar panels, magnets, and robots, which run more and faster labs, which find better materials
Signpost; trigger; gate; dial	A number to watch; a rule decided in advance about it; a trigger that advances a stage; one of three broad measures (wages, capability, concentration)
Stock rule	Be abundant in flows; conserve the stocks
Switches A, B, C	The safety net: build now; cash when wages compress; capital when labor decouples
Three universals	Universal basic machine labor (the power), universal basic goods and services (the floor), and universal basic capital (the ownership)
Tier-3 reserve	A minimum share of surplus machine capacity each charter holds for quests, suspended only under a conservation flag
Town trust	The cooperative that owns a town's place-bound essential infrastructure, one person, one vote, separate from local government
Trade account	Each town's running account in the federation's market: sales netted against purchases at market prices, so goods can pay for goods; only the difference is settled in dollars each period, within a deficit limit
Universal basic capital	One equal, unsellable, portable share per person: membership in the town trust (half) and the federation (half), in the machines and their inputs. It's a stake (a vote and dividends), not the right to use the machines, which belongs to each person. Term from Jacobs and Imas
Use-rights rule	You hold what you use; idle capacity of trust, guild, and party machines returns to open dispatch for anyone to call, and standard machines bought with trust or federation money also offer a charter-set share of their hours; a machine past its service interval can't be lent. Personal machines are the exception: nobody can call yours unless you lend it, because your companion holds your memory and lives in your home

Term	Meaning in this paper
Utility rule	Any market that tips toward one firm is governed like the power grid: by the federation, as a common carrier, one person, one vote
Wear allowance	Each person's equal share of machine wear per period, measured by the machines' wear meters; use is never charged, but when capacity is tight, the people who've used the least go first; one running number per person, reset each period
Worldbuilders	People who argue about direction, not speed: a steering wheel, not a brake or a gas pedal

Appendix E: further reading

On knowledge, prices, and organization

- Friedrich Hayek, "The Use of Knowledge in Society" (1945). The essay every allocation design must answer.
- Ronald Coase, "The Nature of the Firm" (1937). Why firms grow, and why cheap coordination shrinks them.
- Mariana Mazzucato, *The Value of Everything* (2018). Value creation versus value extraction.
- Yanis Varoufakis, *Technofeudalism* (2023). Platforms that own markets and charge rent.
- Benjamin Peters, *How Not to Network a Nation* (2016) and Eden Medina, *Cybernetic Revolutionaries* (2011). Why central planning networks failed.

On market design and commons

- Canice Prendergast, "How Food Banks Use Markets to Feed the Poor" (2017). The Choice System, in its designer's words.
- Alvin Roth, *Who Gets What and Why* (2015). Allocation without prices.
- Elinor Ostrom, *Governing the Commons* (1990). The design principles and the cases behind them.

On energy, matter, and limits

- Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (1971). Funds, flows, and the critique of energy as value.
- Donella Meadows, *Thinking in Systems* (2008) and *The Limits to Growth* (1972, with coauthors). Stocks, flows, and leverage points.
- Gaya Herrington, "Update to limits to growth" (2021). The deadline the build-out has to beat.

On technology and transitions

- Carlota Perez, *Technological Revolutions and Financial Capital* (2002). Installation, turning point, deployment.

- Philip Tetlock and Dan Gardner, *Superforecasting* (2015). What forecasting tournaments taught.

On the economics of AGI

- Julian Jacobs and Alex Imas, *Economic Policy for AGI* (2026). The origin of universal basic capital as a policy option.
- Pascual Restrepo, "We Won't Be Missed" (2025), and Anton Korinek and Donghyun Suh, "Scenarios for the Transition to AGI" (2024). Labor's share under full automation.
- Philip Trammell and Dwarkesh Patel, "Capital in the 22nd Century" (2025). Inequality under full automation.
- Luke Drago and Rudolf Laine, "The Intelligence Curse" (2025). Why power may stop investing in people.
- Emad Mostaque, *The Last Economy* (2025). The closest outside proposal.

Appendix F: need-based credit specification

Need-based credits are a fallback for a town that has nothing to sell and can't cover the difference in dollars (Section 4). They're spent only on lots from the federation's shared reserve. This is the specification pilots would test.

What the food bank auctions taught

Feeding America's Choice System solved almost the same problem: a central body holding goods, local members who know their own needs, and a commitment to serve need rather than wealth (details).

- **The old system failed on information, not intent.** Food was assigned by a formula based on poverty and population. Headquarters couldn't see what each food bank already had, so it sent potatoes to stocked warehouses.
- **The new system kept need and added choice.** Shares are issued in proportion to the same formula. Food banks spend them in sealed-bid auctions held twice a day.
- **Spent shares are redistributed at midnight by need,** which kept the supply constant and meant a well-off bank's high bid funded everyone else's next day. Banks could also sell their own food for shares, which went to the seller minus a 10% levy for the fairness committee, and balances never expired, so some banks built up large unused stocks (Prendergast). This design keeps the first rail and drops the second.
- **Supporting rules:** interest-free credit against future shares, negative bids for unwanted loads, joint bids to split a truckload, and a fairness committee for hardship.

- **Results:** food allocated rose about 35%. Prices revealed what the formula couldn't: food banks would trade 116 pounds of produce for a pound of pasta.

The specification

1. **Need index.** Each town receives credits in proportion to a published index built from measured capacity, not output: population, productive endowment (farmland, water, sun, plant), and documented shocks such as a drought or a failed plant. A town can't raise its share by producing less.
2. **Fixed supply, recirculated.** The total number of credits is fixed. Every credit spent returns to the pool and is redistributed by the index at period end, and credits a town holds for more than a year return too, so there's no credit inflation and nothing to hoard.
3. **Scheduled sealed-bid auctions.** The federation posts reserve lots with lead time and auctions them at set times. Past prices and allocations are public.
4. **Sellers are paid in value, not credits.** The reserve is stocked by member towns' contributions in goods and by federation purchases of surplus at market prices, and towns trade with each other through their trade accounts (Section 4), so selling never depends on credits.
5. **Credit lines, negative bids, joint bids, and delegation,** as at Feeding America.
6. **A fairness body** hears hardship claims, publishing its decisions and reasons.
7. **No exit to dollars.** Credits can't be bought, sold, pledged or borrowed against, or redeemed for money.

The failure modes to watch are collusion between bidders, towns gaming the index, and complexity that favors sophisticated towns. Sealed bids, an index built from measured capacity rather than output or self-reported claims, and delegation address each.