

Philosophy of Finance Fellowship: Fall 2021 Markets and the Environment

Seminar 5: *Environmental Economics from an Austrian perspective*

Mark Sagoff, “What would Hayek do about Climate Change?”

In our final seminar this semester, we take a look at the way Austrian economics approaches questions of the environment. Mark Sagoff, a philosopher professor at George Mason University, makes the case that the Austrian approach of Hayek and Schumpeter is particularly suited to address problems of climate. Unlike “mainstream economics,” Hayek and others of the Austrian School do not conceive of economics as a science allocating resources under conditions of scarcity. Hayek instead holds that the problem economics solves is one of discovery. This difference in definitions is important for at least two reasons. First, climate change is occurring not because of problems of scarcity, but of abundance. There’s plenty of fossil fuels left to burn. Therefore the substitution to cleaner energy sources that economists like Robert Solow predict may not happen in time to prevent potentially catastrophic damage to the planet. We simply can’t wait for fossil fuels to become so scarce that alternatives to them start to become economically feasible. The problem is one of the consequences of burning abundant fossil fuels, and scarcity does not come into the equation. Second, Hayek’s understanding of economics as directed to questions of discovery is well-suited to the need for innovation in new energy sources. This process is just an applied case of the discovery mechanisms which prevail in a market economy where information is widely distributed and the profit motive is operable. Innovation in new technologies is itself a problem of discovery.

Sagoff writes that Hayek would also reject some of the key approaches we’ve seen thus far in the seminar. Hayek would deny that climate problems are the result of market failure for which the fix is government intervention. He would also reject carbon pricing as a solution since it’s a top-down effect to “correct” the market price of fossil fuels which overrides, rather than relies upon, the mechanism of the market. Sagoff argues that Hayek would support government-funded efforts to address climate change, provided that the government was a participant in the market, and did not try to set market prices.

How convincing do you find these arguments? Is the difference in how economics is defined an academic one, or does it have the real-world implications Sagoff thinks it does? Can an Austrian approach to environmental problems succeed?

What Would Hayek Do About Climate Change?

Mark Sagoff

“Groundbreaking’ device turns sunlight into CO₂-free gas”; “Crystalline nets . . . turn carbon dioxide into liquid fuel”; “New chemical approach converts carbon dioxide to valuable fuel”; “Synthetic biologists [engineered] a bacterium . . . that builds its cells by absorbing carbon dioxide (CO₂)”; “LLNL scientist researching hydrogen energy from solar water splitting”; “New reactor could halve carbon dioxide emissions from ammonia production”; “Bezos-backed fusion startup raises \$100 Million for demo system”; “Novel phase-change material acts as thermal battery”; “ARPA-E [announced] Breakthroughs Enabling Thermonuclear-fusion Energy (BETHE)”; “First U.S. wave energy test facility to be built off Oregon coast”; “Improving carbon-capturing with metal-organic frameworks,” not to mention “Hanging bricks, a simpler way of storing energy.”⁴¹

Climate change is often characterized as a “wicked” problem, that is, a problem that is poorly formulated, is deeply contested, involves puzzling information, has innumerable causes, and hence has no single right answer. And yet, despite many questions and controversies, there is a near-consensus about the source of the problem and the needed response. The combustion of coal, gas, and oil is the principal cause of anthropogenic climate change. A technical fix — cheap and abundant clean energy — would solve the problem. There are as many right answers as there are clean and inexpensive kinds of useful energy. But each answer depends upon a godsend of technology.

Where that godsend will come from is a different question, one that mainstream economists have struggled with for decades. Mainstream economic theory cannot explain massive investments in gee-whiz technologies, such as those described above, to replace fossil fuels. Mainstream theory is predicated upon the notion that when a resource becomes scarce, its price rises, leading markets to use the resource more sparingly or to substitute more plentiful resources to do the same job.

Markets have no inherent mechanism to handle climate change because climate change presents a problem not of scarcities but of consequences. There is plenty of coal, gas, and oil, and the atmosphere will soak up as much CO₂ as we wish to produce — and a great deal more. Future generations, however hot and miserable, will have lots of coal, gas, and petrol. In any scenario, however awful, these fuels will still burn, and there will be plenty of them. The punchbowl of fossil fuel seems bottomless.

Acknowledging this, mainstream economic theory hypothesizes that the necessary innovations will appear, like rabbits, from the hat of a globally enforced carbon price. This belief requires magical, that is, theoretical, thinking. There is no evidence that an emissions “cap” or tax leads to clean energy technologies. Fiat prices get finagled. Regulations may be only as good as the last election or administration. Powerful industries may be less inclined to invest in new technologies than to

wheedle exceptions or wrangle loopholes to dodge carbon “caps” or taxes. Firms may hire lobbyists before they hire engineers.

Nonetheless, and contrary to mainstream theory, individuals, organizations, firms, and agencies avidly work on inventions to substitute for coal, gas, and oil despite low fossil fuel prices and in the absence of a carbon price. If these efforts at innovation are profitable, so much the better; but that is not the point. These projects respond less to the profit motive than to the allure of solving major problems and the hope of doing big things.

Entrepreneurs who are piling on to create clean energy sources exemplify the creative and dynamic nature of markets, as management guru Peter Drucker describes it, to organize and apply knowledge to knowledge to get things done.^[2] This is not price competition, efficiency, or a “pareto optimized” equilibrium. This is creative entrepreneurial energy. “It is the new things that humanity has discovered which makes its history exciting; and the new things that may be found in the future, before humanity blows itself up, or settles down to some ghastly ‘equilibrium’, make a future worth praying for, and worth working for,” the British economist John Hicks observed half a century ago.^[3]

How do entrepreneurs acquire the knowledge they need to create those things? “The economic problem of society,” Friedrich von Hayek wrote, is “not merely a problem of how to allocate ‘given’ resources, it is a problem of the utilization of knowledge not given to anyone in its totality.”^[4] Hayek continued, “It is through the mutually adjusted efforts of many people that more knowledge is utilized than any one individual possesses or than it is possible to synthesize intellectually; and it is through such utilization of dispersed knowledge that achievements are made possible greater than any single mind can foresee.”

Along with others of the Austrian School, especially Joseph Schumpeter, Hayek differed from mainstream neoclassical economists, according to whom markets allocate resources to those willing to pay the most for them and therefore (tautologously) maximize social welfare. According to Schumpeter, perfect competition, in which profits disappear as markets drive prices down to costs, is not what counts, but rather “the competition from the new commodity, the new technology, the new source of supply, the new type of organization . . . which strikes not at . . . the profits . . . of the existing firms but at their foundations.”^[5]

For Hayek and others of the Austrian School, economic problems arise with and are resolved by the discovery and coordination of bits of knowledge and know-how, which are dispersed across society and are not available to any one agency, authority, or individual. The entrepreneurial effort to develop and deploy clean energy technologies disrupts the “givens”: for example, the kinds of resources that are or can become available, at what cost, and how they may be used to make fossil fuels obsolete. The economic problem for Hayek — this would apply to climate change — is never a maximization problem, that is, a problem of how to direct given resources efficiently to satisfy given wants. It is always a discovery problem, that is, a problem of how people may act not on the

knowledge they have but on the knowledge they find, create, and apply to change both their wants and the resources they need to satisfy those wants.

1.

In his 1974 Nobel Prize acceptance speech, Hayek observed that our confidence that we shall overcome resource depletion “rests on an act of faith. We are generally confident that, by the time the resource is exhausted, something new will have been discovered which will either satisfy the same need or at least compensate us for what we no longer have.”^[4]

Hayek’s act of faith comports with standard mainstream economics. In his speech, Hayek took aim at the Club of Rome projections, published two years earlier, which had predicted, among other things, the collapse of the global economy within decades because of the depletion of natural resources.^[7] In the 1960s and 1970s, mainstream economists, including William Nordhaus, Robert Solow, and James Tobin, developed a theory based on persuasive empirical evidence that when a resource becomes scarce, higher prices will lead to the substitution of more plentiful resources.^[8] Solow wrote that “higher and rising prices of exhaustible resources lead competing producers to substitute other materials that are more plentiful and therefore cheaper.” Solow observed that there have been and “there will be prolonged and substantial reductions in natural-resource requirements per unit of real output.” He asked, “Why shouldn’t the productivity of most natural resources rise more or less steadily through time, like the productivity of labor?”^[9]

While Hayek generally agreed with this, he differed from mainstream economic theory in three profound ways. First, mainstream economists have typically defined their discipline as the study of the allocation of scarce resources among unlimited wants. According to this mainstream view, in efficient or “perfectly competitive” markets (i.e., those without “externalities”), buyers and sellers — who are assumed already to possess all relevant information, such as their preferences, the terms of exchange, the amount and quality of assets, where they are found and how they are transported, and so on — by trading goods bring prices down to costs and extract all the benefits of trade. This framework is foreign to Hayek.

Hayek lambasted the Neoclassical economist’s fixation on perfect competition because it ignores the epistemic and institutional context in which competition takes place — a context in which discovery, invention, innovation, bargaining, collaboration, entrepreneurship, investment, opinion, regulation, social movements, and so forth arise, all of which motivate economic activity and make it possible. Hayek described the economic problem in terms of the institutional arrangements in which individuals are most likely to acquire, discover, and coordinate bits of relevant knowledge to be found in all these contexts about what goods might become available, of what quantity and quality, and on what terms and what other information people need to accomplish their plans or, more likely, continually to adjust and revise them.^[10]

Second, mainstream economists associate price with value, that is, the intersection of 1) the demand for (and thus the economic value of) the next or incremental unit of a good and 2) the cost of producing it. Hayek did not consider price as a measure of value; he saw it as a conduit of information that firms and individuals need to choose, refine, and accomplish their plans. Information always changes, and new knowledge is constantly discovered. Hayek wrote that

"decentralization has become necessary because nobody can consciously balance all the considerations bearing on the decisions of so many individuals. . . . because all the details of the changes constantly affecting the conditions of demand and supply of the different commodities can never be fully known, or quickly enough be collected and disseminated, by any one center, what is required is some apparatus of registration which automatically records all the relevant effects of individual actions."^[11]

According to Hayek, the price system, the “apparatus of registration,” coordinates the activities of individuals and firms but says nothing about the value of anything.^[12] To be sure, welfare economists define “value” or “benefit” in terms of psychological or subjective constructs, e.g., “preferences” or “satisfactions” they believe they can measure; they then try to second-guess market prices by aligning them to these made-up conceptual constructs.^[13] Hayek fulminated against Utilitarianism or welfarism, which had infected economists with the “fatal conceit” that they could outsmart market players and get the prices “right.” By chanting a ritual “market failure” abracadabra over social problems, economists would replace a free-market economy with cost-benefit analysis, the better to achieve a figment of their mathematical imagination, i.e., welfare, being better-off, or utility, which they expect to be paid to measure.^[14]

While Hayek recognized that doctrinaire socialism associated with the Soviet Union was defunct in the Western world, he feared that economic freedom and, with it, productivity would die of a thousand cuts as governments constantly intervened in markets to promote “efficiency,” a theoretical construct, by “correcting” prices. An official price on carbon, for example, might encourage bets about the likelihood of continued enforcement, which is not useful knowledge to those who are looking for climate solutions. Driven by noble intentions, reformers “impose more and more central control over economic decisions . . . until we get that very system of central planning which few now consciously wish to see established,” Hayek wrote.^[15]

Third, Hayek disagreed with mainstream Neoclassical economists about the function and purpose of markets. For mainstream economists, individuals engage in economic activity to promote their self-interest; they want to maximize the satisfaction of “given” preferences they are said already to know. According to this standard view, in a liberal society, the rule of law — which enforces contracts, respects property, and requires consent — transforms the pursuit of self-interest into the promotion of the social interest or the interest of society as a collective whole. Under liberalism, as Adam Smith wrote, the individual is “led by an invisible hand to promote an end which was no part of his intention” – the interest of society.^[16] On this view, market prices orchestrate our interests. As Smith continued, “It is not from the benevolence of the butcher, the brewer, or the baker, that we expect

our dinner, but from their regard to their own interest. We address ourselves, not to their humanity, but to their self-love.”

Hayek did not regard people as psychological egoists or as satisfaction-maximizers (nor did Smith in other writings) but as individuals organized in many ways, for example, in firms, in civic and religious associations, and in households with overall plans or ends-in-view subject to change in response to further information and learning-by-trying. The institutions of a liberal society, with their respect for the rights of person and property and their emphasis on consent, enable those who are ignorant of most things — i.e., everyone — to coordinate their activities in ways that use or apply bits of knowledge and know-how dispersed across society and cannot be assembled by any individual or by a scientific committee. The principal function of markets, then, is to develop, discover, distribute, and deploy knowledge, often tacit knowledge implicit in social customs and practices and know-how that cannot be theorized. Markets are for discovery not for utility.

Hayek believed that the institutions of liberalism are justified because they are the rational response to our ignorance and to our need constantly to adjust our beliefs, desires, hopes, ambitions, plans, and predictions to changing possibilities and conditions of which actual market prices make us aware. Liberty is the antidote to ignorance. Hayek wrote,

"Liberty is essential in order to leave room for the unforeseeable and unpredictable; we want it because we have learned to expect from it the opportunity of realizing many of our aims. It is because every individual knows so little and, in particular, because we rarely know which of us knows best that we trust the independent and competitive efforts of many to induce the emergence of what we shall want when we see it."¹⁷¹

2.

Hayek wrote that the “curious task of economics is to demonstrate to men how little they really know about what they imagine they can design.”¹⁸¹ He thought that prices solve the division of knowledge problem in the same way they solve the division of labor problem.¹²⁹ The economic task is one of *coordination* in relation to information implicit in actual prices, rather than one of *valuation* in relation to policy objectives. The principle applies whether the objectives are specific, like lower carbon emissions, or nebulous and abstract, like welfare, utility, consumer surplus, efficiency, and net or aggregate willingness to pay.

By contrast, contemporary economists, dazzled by their uncanny ability to analyze any problem, including global warming, as a market failure, propose that political authorities, whom they are eager to advise, “correct” the failure by taxing fossil fuel, for example, or by setting a “cap” under which industries must trade emission allowances. These economists tout their theoretical fixes — “caps” or “taxes” — but know nothing about case-by-case, problem-by-problem technological fixes, which are required. The economist Albert O. Hirschman criticized the penchant of his discipline to announce theoretical fixes or “shortcuts to the understanding of multifarious reality that must be coped with and controlled and therefore be understood at once.”²⁰¹

Carbon pricing offers a quick theoretical fix, a kind of magical pathway or shortcut, which takes attention and effort away from piece-by-piece, one-step-at-a-time innovation.

From Hayek's perspective, interventions are wrong-headed if they are based on abstraction not on practice: if they represent the ruling theory of an academically trained nomenklatura rather than the trial-and-error lessons learned by those outside the academy who get things done. Efforts to "correct" market prices misconceive the function prices serve, which is to coordinate bits of knowledge and information dispersed across society, rather than to indicate or correlate with the value of anything.

Consider a carbon tax. "Among economists, this is not controversial," according to Greg Mankiw, chair of the Council of Economic Advisers under President George W. Bush. "The politics is complicated, the international relations is complicated, but the economics is really simple."^[24]

One could draw an analogy with the theory of energy storage, the theory of fusion, the theory of releasing hydrogen from water, and so on. The theory is simple; the problem is always one of engineering and scaling up. How do we know whether it is easier to engineer and scale-up a carbon "price" than any of many more direct *deus ex machina* clean energy technologies?

At what level of production or consumption would a carbon tax be levied? It might be most convenient to levy it at the mine or wellhead, i.e., at the source of production. But suppliers are not emitters.^[22] The only experience we have with excise taxes, moreover, is intranational; thus, the legal authority that imposes the tax also enforces it and collects the revenue. To suppose that international negotiators could agree upon the amount of a tax and a way of collecting it and dividing the proceeds is truly to "assume the can opener" in the jargon of economics.

People will pay only the taxes intelligible to them. If the government taxes petrol to pave the roads, most do not object to this use tax, because it makes sense to those who pay it. If the government, in response to its armchair-economist whisperers, taxes petrol to save the planet, it may salve the conscience of urban elites and cosmopolitan bicyclists, but folks in rural areas, who depend on tractors and trucks, may riot, as the Yellow Vests did in France starting in 2018. One can see the connection between a gas tax and road repair, but the relation between it and planet repair is more conceptual, abstract, indirect, theoretical, and conjectural. "Higher taxes on energy have always been a hard sell, politically," Mankiw acknowledged. "The members of the American Economic Association are convinced of their virtue. But the median citizen is not."^[23]

The cap-and-trade strategy inaugurated under the UN Intergovernmental Panel on Climate Change (IPCC) framework offers a cautionary tale. Any competent economist, not just Hayek, would hear in a top-down attempt to price carbon a cattle call for scamming, creative accounting, rent-seeking, subterfuge, dishonesty, deception, special pleading, fraud, resistance, unrest, and every kind of perverse, not just unintended, consequence one can think of and others not yet imagined.^[24] This in fact is what happened.

The carbon markets created under the IPCC and Kyoto framework — the Clean Development Mechanism (CDM), Joint Implementation (JI), and International Emissions Trading (IET) — have issued a humongous amount of carbon credits, known derisively as “hot air,” which in an international context suffocate any further carbon trading. Credit supply vastly exceeds demand.

According to a Carbon Market Watch study, in December 2019 CDM had available for bidders a total potential supply of around 4.6 billion emission credits (representing 4.6 GtCO₂e). The JI offers credits for 220 million tonnes. But, “both systems are dwarfed by the number of Assigned Amount Units (AAUs)” from IET. The study continued, “There are still 14.1 billion AAUs available from the Protocol’s first commitment period, and, if the second commitment period were to enter into force, this would create an extra surplus of around 1.7 billion.” In addition to all this, the study noted, “countries could potentially create between 18.7 and 28.3 GtCO₂e worth of credits — or ‘hot air’ — that they can sell without reducing a single tonne of greenhouse gas emissions.”^[25] Credits exceed emissions. Global emissions of CO₂ were projected at 37.1 gigatonnes (Gt) in 2018.^[26]

Carbon credits are now so cheap that they do not justify the time, effort, and expense needed to claim them.^[27] The number of credits that overhang carbon markets today, however humongous, are billions fewer than the number that would become available if they had monetary value and those who could claim them bothered to do so. These credits stymie any further trading. Now negotiators must spend their time trying to undo what they have done.

Any competent economist — not just Hayek — could have predicted that a fiat market that cuts “credits” out of political whole cloth will distribute them accordingly. Actual markets, which have evolved over centuries, are able to rely on systems of entrenched and trusted methods of accounting, accountability, contract, and exchange. When prices are set artificially, market players game the likelihood of enforcement, while actual prices emerge from consensual activity and do not need to be enforced. Ultimately, markets rely on trust and therefore on voluntary exchange and cooperation within legal and institutional frameworks that are entrenched in social consciousness. Coercion does not buy cooperation; it is not coordination. Panels of economic experts eager to set carbon prices have not created norms, processes, and protections that engender public faith and trust; however rational and scientific their authority may seem to them, these expert panels override rather than engage market and legal processes that discover and disperse the knowledge and information on which people rely and that no central committee or planning agency can command.

Mainstream economists tout pricing carbon, which creates a return to them for their theories and services. Experience teaches, however, that solutions to social problems emerge through social learning, experimentation, trial and error, and evolution. In Aesop’s famous fable, a council of mice agree to bell the cat to protect themselves, but then not one of them is willing to do it. The concept of belling the cat, like the concept of taxing or trading emissions, is simple: “Good council’s easily given, but the effect / Oft renders it uneasy to transact.”^[28]

The point is that carbon markets are technologies like any other — energy storage, nuclear fission, fusion, hydrogen, etc. — the basic science or theory of which may be simple. The problems are always the same: engineering, scaling up, and cost. What we have learned is that carbon trading or taxing may be harder to engineer and scale, cost more, and raise more enforcement questions than other technologies that have as good a chance of pinning the tail on the climate crisis donkey. What is worse, attempts to “price” dirty fuel may distract from and compete with urgent and necessary efforts to underprice it with clean energy technologies.

Market forces must be enlisted in the pursuit of clean, inexpensive, and deliverable energy to substitute for fossil fuel in many or most of its uses. How this will happen, however, depends on the specific use, e.g., industrial, household, transportation, and an infinite number of contingencies of time and place, such as how to transmit abundant wind energy to where it is needed. What is crucial, Hayek wrote, is “concrete and often unique knowledge of the particular circumstances of time and place.”^[29] Those with this kind of knowledge may act as entrepreneurs to design climate-friendly processes or methods, which may more often depend on clearing regulatory hurdles than on erecting them. Ideas applied successfully in one context may be adopted in another. Entrepreneurs who arbitrage opportunities for clean technologies must operate within the epistemic environment of actual prices; otherwise, as we have seen post-Kyoto, chicanery may become more profitable than creativity.

3.

Mainstream economic theory has been a disaster in its framing of the problem of global warming because it assumes that market players compete in a static system and know the *givens* in advance: what resources are available, who has and who wants them, and what are the terms of exchange. These facts are never *given* but always *discovered*. “Any approach,” Hayek states, “such as that of much of mathematical economics with its simultaneous equations, which in effect starts from the assumption that people’s *knowledge* corresponds with the objective *facts* of the situation, systematically leaves out what is our main task to explain.”^[30]

Hayek would not have opposed government-funded initiatives to promote clean energy and other “disruptive” technologies. The crucial distinction is this: governments must act within markets (e.g., by purchases, subsidies, or other means) rather than upon them (e.g., by setting prices). Governments, in other words, must participate in markets on the same terms as everyone else. “It is the character rather than the volume of government activity that is important,” Hayek explained. A free society “demands not only that the government have the monopoly of coercion but that it has the monopoly only of coercion and that in all other respects it operates on the same terms as everybody else.”^[31]

Hayek was an enemy of fixed prices but not of Big Government. Hayek described *laissez-faire* as “a highly ambiguous and misleading description of the principles on which a liberal policy is based.”^[32] He advocated the use of funds raised by general taxation to support education, public

health, a minimum wage and income, research, parks, infrastructure, cultural activities (including sports), and insurance against catastrophic events.¹³³ He wrote that “far from advocating . . . a minimal state, we find unquestionable that in an advanced society government ought to use its power of raising funds by taxation to provide a number of services which for various reasons cannot be provided, or cannot be provided adequately, by the market.”¹³⁴

Hayek explained, “The basic principle of the liberal tradition, that all the coercive action of government must be limited to the enforcement of general rules of just conduct, does not preclude government from rendering many other services for which, except for raising the necessary finance, it need not rely on coercion. . . . I am the last person to deny that increased wealth and the increased density of population have enlarged the number of collective needs which government can and should satisfy.”¹³⁵

When public laboratories, research facilities, funding agencies, etc. enter markets by stimulating innovation, taking risks that exceed private means, enriching the knowledge base, or just banging heads together at conferences, panels, and public–private partnerships, they play the same entrepreneurial role as firms in the private sector. The government does not pretend to know more than other market players about the “value” of anything; it does not claim to “correct” prices to “internalize” social costs. It is a price-taker. It may try to lower prices for climate-friendly goods by favoring them in procurement, by “crowding in” advances likely to achieve them, and by indulging promising start-ups and small businesses, as it has for many years, with tax breaks and subsidies.¹³⁶ A mixed economy in which public and private actors together build the knowledge base, including knowledge of local circumstances, customs, needs, culture, and legal and other institutions, would be acceptable to Hayek. He wrote that “an active government that assists the spontaneous forces of the market is preferable to a less active one that does the wrong things.”¹³⁷

4.

What will it take for clean energy technologies to scale up and to pan out? It takes money, and it takes knowledge. Entrepreneurs who invest in climate-friendly technologies — what else would you do with your billions? — trust only market prices, though they also like tax credits and subsidies. Market prices help discover and convey changes in knowledge and know-how relevant to each time and place. These are communicated to those who develop the haptic capacities of skin in the game.

Doctrinaire Marxists and doctrinaire Neoclassical economists alike promote production for use rather than for exchange. The “exchange” value of a good is its market price; this typically reflects how much it costs to supply. The “use” value of a good is defined as the utility or benefit it provides. Neoclassical economists believe they can measure this. For Hayek, there is little difference between a Neoclassical and a Socialist calculation of “use” value. Neoclassical economists “correct” prices to assure the proper valuation of “external” outputs of production. They would set fossil fuel prices, therefore, to account for the harmful emissions they cause. Socialist economists set prices to assure the proper valuation of labor and other inputs to production. Either way, social scientists

assume the commanding heights, in Lenin’s useful phrase, which is probably the whole point anyway, i.e., the will to hegemony and power.^[38]

If the American Economic Association (AEA) had its way, it would set prices in terms of its calculus of the social cost of carbon. Entrepreneurs would then plan not around market prices but around AEA “prices,” which float in the doctrinal and political winds. This would turn investment into speculation — bets on what the next administration or central committee will do.^[39] No one would know when to jump into the market and from how high. Entrepreneurs, who seek now to compete with the market price of fossil energy, would have to readjust their efforts to the artificial price, leaving their disruptive and dramatic ambitions behind.^[40]

By supposing that academic adepts can know enough to set prices in terms of social benefits, Neoclassical economists ignore the vast amount of contextual information, including social norms, customs, practices, expectations, and opportunities, available to entrepreneurs engaged in problem-solving in a given industry or at a given place and time. In their recommendation that governments set prices to internalize externalities and thus to capture value-in-use, Neoclassical economists falsify the very information about value-in-exchange that entrepreneurs need to understand the realities of energy and related markets.

The “consumer surplus” analysis of welfarism and the “surplus value” analysis of Socialism both rely on comparative statics (that is, models frozen in time) that assume an equilibrium to be managed from the commanding heights of economic theory. Neither see the dynamic processes that constantly upend these models. They both miss the information processes, contextual and particular to time and place, that keep readjusting prices to the dynamic, creative, and disruptive role entrepreneurs play in resolving the shortfalls of markets. There is never an equilibrium, only a process of equilibration. Hayek understood that we are not sure even about the “intended” consequences of our actions until we see how things work out in experience — “what we shall want when we see it.”^[41]

5.

There is no such thing as business as usual. A business-as-usual scenario cannot happen because the only economic constant is change. In June 2020, Shell wrote down its value by \$22 billion in response to tanking oil prices; BP took a \$17.5 billion write-down.^[42] What were reservoirs of wealth had become stranded assets virtually overnight. Only the paranoid, the hyperdynamic, the novel, and the unusual businesses survive. Because there is no such thing as business as usual, climate science can tell us what levels of atmospheric CO₂ correlate with what dire consequences, but it is utterly unprepared to say what those levels might be 50 or 100 years from now. In that time, a global pandemic may reduce all economic activity to a mere nubbin, or a breakthrough fusion technology may give the world clean energy as great as any star. Or both.

Climate change presents the latest challenge to the faith that ingenuity will overcome environmental challenges to economic growth. The application of knowledge to knowledge makes all the difference. In an influential article, Steve Rayner pointed out that “different actors have very different motivations for action and capabilities to contribute to the climate change challenge.” The problem is to release the needed knowledge wherever it can be found, which is often in the most unexpected places. Rayner advocated a climate strategy that avoids the “top-down” assume-the-can-opener approach of the Kyoto Protocol and instead originates “from the ‘bottom up’ within nations, based on their own institutional, technological, economic and political capacities but which cumulatively will lead to a fundamental technological shift in global patterns of energy and land use.”^[43]

Rayner wrote that the world is full of “unknown knowns,” by which he meant tacit knowledge, knowledge implicit in skills and know-how, and contextual and specialized knowledge of people who know what they are doing.^[44] Rayner like Hayek thought that what works is the concrete and often unique knowledge of the particular circumstances of time and place. Hayek wrote, “The wider aspect of the problem of knowledge with which I am concerned is the knowledge of the basic fact of how the different commodities . . . are actually obtained and used.”^[45]

This kind of knowledge is unknown to policy analysts, climate savants, and erudite economists, because they do not need practical, local, and dispersed knowledge but only their general abstractions to contribute to the academic literature and make public pronouncements, which they confuse with speaking truth to power. They mostly refine their theoretical apparatus for the edification of each other. They can be ignored. Entrepreneurs, investors, inventors, managers, engineers, and other actors, however, use concrete, specific, implicit, and often local know-how to get things done.

The problem is often to coordinate the knowledge that exists — the “unknown knowns” in Rayner’s sense — as well as to find new knowledge and to grasp surprising concatenations of different kinds of information. According to Hayek, the “solution of the economic problem of society is in this respect always a voyage of exploration into the unknown, an attempt to discover new ways of doing things better than they have been done before.”^[46]

Knowledge, Hayek argued, is always embodied in the context of its discovery and use. It is always knowledge of the process, practice, or opportunity that arises at a time and place. It is always knowledge and know-how that occur within institutional settings that allow discovery, collaboration, and experiment. In that sense, all knowledge like all politics is local: its use depends on the circumstances in which it is applied.

Top-down planners have no access to this kind of information. These planners talk in abstract shibboleths — “price carbon!,” “internalize externalities!,” “make polluters pay!” — which express the self-righteousness of the theory class but contain nothing relevant to the solution to any problem. The AEA membership delight in these nostrums; their magical assume-the-can-opener

thinking has produced little but hot air. To solve problems, one must take up one technological challenge at a time. This requires knowledge of concrete and specific ways information and know-how can be applied industry by industry, processes by process, use by use, and place by place. Rayner memorably observed that one deals with climate change in the same way one eats an elephant, one part at a time. Hayek would have agreed.

Read a rebuttal to this piece by Niskanen Center's Ed Dolan [here](#).