

# Pie in the Sky



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**SKY TRUST**

A project of Corporation  
for Enterprise Development

THE BATTLE FOR ATMOSPHERIC SCARCITY RENT



Corporation  
For Enterprise  
Development

**Peter Barnes and  
Rafe Pomerance**



#### THE CORPORATION FOR ENTERPRISE DEVELOPMENT

promotes asset-building and economic opportunity strategies, primarily in low-income and distressed communities, that bring together community practice, public policy, and private markets in new and effective ways.

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# How a Sky Trust would work

Based on the idea that the sky is a common asset owned by all Americans, a Sky Trust would promote climate stability by: limiting the amount of carbon that can be put into the atmosphere; allowing the free market to set a price on the right to emit carbon; collecting revenue from those who buy those rights; and returning earned revenue to the owners of the sky.

#### Sky Trustees would have three responsibilities:

- 1) to issue and monitor carbon emissions permits up to a limit established by Congress,
- 2) to receive market prices for those permits, and
- 3) to distribute the income equally to all Americans.

#### Sky Trust policy framework has five components:

- 1) **Cap:** establish a maximum level of carbon waste that can be emitted into the atmosphere .
- 2) **Auction:** sell permits, at market value, to companies that introduce carbon into the U.S. economy.
- 3) **Trade:** allow companies to trade permits in secondary markets.
- 4) **Rebate:** return income derived from permit sales to all Americans who, together, own the sky.
- 5) **Trust:** create an administrator to manage income and to be accountable to all Americans.

#### ABOUT THE AUTHORS:

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## There's a trillion dollar pot of gold in the sky, and it's called atmospheric scarcity rent. Though hardly anyone talks about it, a battle is looming to see who gets this treasure.

What on—or above—earth is atmospheric scarcity rent? Scarcity rent is what owners of things that are in high demand can collect from other people just because of scarcity. The Mona Lisa, for example, has a high scarcity rent because there is big demand for her, but only one original. In general, the more scarce (relative to demand) things like buildable land or Mark McGwire home run balls are, the higher their scarcity rents.

Atmospheric scarcity rent is a new phenomenon that reflects the growing scarcity of important services the sky provides to human users. For example, the sky “carries” electromagnetic waves that are indispensable to broadcasters and telecommunications companies. These waves are scarce because there are only a limited number of usable frequencies that don't interfere with each other. In 1997, when Congress gave broadcasters a large chunk of the electromagnetic spectrum to use for digital broadcasting at no cost, opponents like Senator John McCain (R-AZ) called it a “\$70 billion giveaway.”

The specific form of atmospheric scarcity rent that is of concern here is that which results from the limited capacity of air to absorb carbon dioxide. Our demand for sky-borne carbon storage is, of course, the flip side of our demand for fossil fuels: the more we burn of the latter, the more we require of the former. Up till now, people and countries have paid handsomely for oil but nothing for the air that holds its combusted waste.

That disparity is about to end.

What science has shown—and governments officially recognized in the 1990s—is that **Chicken Little had it almost right. The sky isn't falling; it's filling** Our atmosphere (the sky) can safely absorb only so much acid-brewing sulfur, ozone-eating chlorine, and heat-trapping carbon dioxide, and it's now reaching those limits. To put it another way, it's not oil that's in short supply, it's sky.

In the new era of scarce sky, there will, of necessity, be an economy of sky. Property rights will be established, prices will be charged, and money will change hands. A lot of money. As a result of the current global warming crisis, the establishment of these new property rights will occur soon. Owners of sky will collect rent that will flow back into the economy, just as land rent does now.

The battle looming now is over who will get that pie in the sky. As MIT economist A. Denny Ellerman noted, “the scarcity implied by the Kyoto Protocol targets is significant, on the order of 30 percent of 2010 emissions. This raises fundamental issues of equity and the definition of rights, which are pre-eminently of the political realm. In fact, there will likely be agreement on the creation of the scarcity only as there is agreement on the allocation of the rents thereby created.”<sup>1</sup>

**The Sky Trust initiative proposes that atmospheric scarcity rent be paid to everyone equally—one citizen, one share.** This publication explains the rationale and mechanics of this innovative campaign to reduce U.S. carbon emissions and share the scarcity rent.

## About the economic threat that stems from global warming. . .

An expert panel of the National Academy of Sciences recently concluded that the Earth is indeed warming faster than ever before in the 20th century. This report is merely the latest in a long series of studies reaching similar conclusions. In 1995, the Inter-Governmental Panel on Climate Change, representing leading international climate scientists, concluded that “the balance of evidence suggests a discernible human influence on global climate.”

Some of the possibilities widely feared among climate scientists directly threaten American society and its prosperity. Among these consequences are: more frequent and severe droughts; intensified hurricanes and other storms; rising sea levels; disruption of natural ecosystems; and extinction of species. Other long-term shifts in U.S. weather patterns are likely; their consequences, unpredictable.

In today's increasingly global economy, impacts on other nations may have important implications for the U.S. For example, the predicted sharp declines in agricultural productivity in Mexico may imply increased levels of illegal immigration. Or, the projected dramatic increases in Russian and Canadian wheat exports may imply intensified competition for U.S. grain.

Intergovernmental Panel on Climate Change (IPCC), Climate Change 1995, The Science of Climate Change, Summary for Policymakers (Cambridge: Cambridge University Press, 1996), p. 10.  
“Climate Change: The State of Knowledge”, Executive Office of the President, Office of Science and Technology Policy, October 1997, Figure 20.

## About the Kyoto Protocol. . .

From December 1 through 11, 1997, more than 160 nations met in Kyoto, Japan, to negotiate binding limitations on greenhouse gases for the developed nations, pursuant to the objectives of the Framework Convention on Climate Change of 1992. The outcome of the meeting was the Kyoto Protocol. Under the Protocol, adopted in December 1997 and signed by the United States in November 1998, industrialized nations agreed to cut emissions of greenhouse gases on average of 5% below 1990 levels, beginning in 1998. The United States was the 60th and last industrial nation to sign the treaty, agreeing to a 7% reduction. The treaty defines greenhouse gasses as: carbon dioxide (CO<sub>2</sub>); methane (CH<sub>4</sub>); nitrous oxide (N<sub>2</sub>O); hydroflourocarbons (HFCs); perflourocarbons (PFCs); and sulphur hexafluoride (SF<sub>6</sub>).

**While a primary function of government is to define and enforce rules of property, there are still a number of valuable assets for which clear rules don't yet exist. The sky is among them.**

The atmosphere and its limited absorptive capacities are just out there, waiting to be taken. Consequently, the sky has been subject to what biologist Garrett Hardin called the tragedy of the commons.

In a famous 1968 essay, Hardin wrote:

*The rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another...But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy...*

*In a reverse way, the tragedy of the commons reappears in problems of pollution. Here it is not a question of taking something out of the commons, but of putting something in... The rational man finds that his share of the cost of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them. Since this is true for everyone, we are locked into a system of "fouling our own nest."<sup>2</sup>*

Hardin erroneously believed that this tragedy resulted from common ownership and that there was no way to fix it short of full-scale privatization or coercive government action. What he didn't foresee was the inven-

tion and implementation of "cap-and-trade" systems. A cap-and-trade system provides a relatively simple solution to a dauntingly complex question. To begin, a cap is set to limit the total amount of pollution allowed, or the maximum load line. The cap translates the natural scarcity of waste storage capacity into information to which markets can respond. Typically, the cap gets lower every year, so pollution is phased down gradually as the market responds by developing greater efficiencies.

The next step is to create and assign property rights. In this example, the right is to emit a certain amount of waste (for example, a ton of carbon) into the commonly owned atmosphere over a designated length of time. These rights (the sum of which is equal to or below the limit set by the cap) are created and assigned by government. To think of it another way, a cap could be the number of parking spaces available for rent in a shrinking public garage. Whomever buys a monthly contract can park in or sell the space to someone else, but once the garage is full, that's it.

The cap-and-trade system is a brilliant invention that allows market economies to protect natural resources and lets businesses design and employ the most cost effective methods for cutting pollution. For example, if a company can reduce its pollution output for less than the cost of an emission permit, it will. If a company cannot reduce its pollution output for less than the cost of an emission permit, it will buy a permit from another company that can. The end result is that pollution is reduced at the lowest total cost to society. **The cap-and-trade system uses free market forces to leverage greater efficiencies.**

The first major cap-and-trade system applied on a national scale was designed to curb sulfur emissions, a

cause of acid rain. Because coal contains a fair amount of sulfur, and because sulfur dioxide in the air turns to sulfuric acid, smoke from power plants in the Midwest produce acid rain in New England and New York. Sulfur emissions are reduced a number of ways: energy efficiency can be increased; low-sulfur coal can be burned; coal can be chemically cleansed before burning; scrubbers can remove sulfur dioxide in smokestacks; and coal-burning facilities can be converted to natural gas. Such measures, however, cost money and as long as the price of emitting sulfur is zero, there is no incentive for any company to incur an "unnecessary" expense.

In 1990, Congress passed and President George Bush signed a law requiring that total U.S. sulfur emissions be cut by 50 percent over 20 years. The law allowed for a gradually declining number of emission permits that companies can use, sell, or trade. A secondary market developed for the permits and, at the beginning of the year 2000, permits were selling at prices set purely by supply and demand for about \$200 a ton.

If a company can reduce its sulfur emissions for less than \$200 a ton, it will become as efficient as possible and sell its permits, turning a small profit. Alternatively, a company can save its permits to be used for future operations. Finally, if a company cannot cut emissions for less than \$200 a ton, it must buy permits from another company, from a broker, or from the Chicago Board of Exchange.

The sulfur cap-and-trade program has been highly successful in reducing emissions.

**The success of the sulfur cap-and-trade program has persuaded environmental experts and policymakers alike that a similar system is the best way to reduce carbon emissions.**

There are two critical questions, however, that a cap-and-trade system raises but doesn't, by itself, answer:

- Should initial emission rights be given, at no charge, to existing polluters or sold to bidders in a competitive auction?
- If the rights are sold rather than given away, to whom should the revenue go? To put it more succinctly, who should own the sky?

In considering these questions, it is important to distinguish between the *use* of the sky and the *beneficial ownership* of it. In a cap-and-trade system, the right to use the sky (that is, to emit gases into it) is linked to the ownership of emission permits that can be freely bought and sold. The right to the economic beneficial ownership of the sky (that is, to receive income derived from it) is something else. Henceforth, it is the latter of the two that concerns this paper.

In pondering the question of who is, or should be, the beneficial owner of America's portion of the sky, a good place to start is with Roman law, from whence our system of property rights derives. Roman law distinguished between four types of property:

<sup>2</sup> Hardin, Garrett, "The Tragedy of the Commons," *Science* 162(1968): 1243-1248.

Available at <http://dieoff.org/page95.htm>.

- **Res privatae, private things** - things in the possession of an individual or corporation;

- **Res publicae, public things** - things owned and set aside for public use by the government, such as public buildings, highways, and navigable waterways;

- **Res communes, common things** - things accessible to all that can't be exclusively possessed by an individual or government; and

- **Res nullius, unowned things** - things that have no property rights attached until they're taken into possession and become res privatae or res publicae.

The category of concern here is *res communes*, things common to all. In this category are air, sea, shore, navigable rivers, and wild animals. As stated in the Institutes of Justinian:

*[Some] things belong in common to all [persons] by jus naturale, some to a community corporately, some to no one, but most belong to individuals separately, being ascribed to someone on one of various grounds. And indeed by natural law the following belong in common to [all]: air, flowing water, and the sea, and therewith the shore of the sea.*<sup>3</sup>

There is, thus, a very old and very clear distinction between common property and state property. The air is decidedly common property.

Like Roman law, English law distinguished between state property and property available to all citizens. The second kind included the air, running water, the sea, fish, and wild animals. The king held titles to these assets but their use remained open to all people.

England added the institution of land owned in common by villagers. Such common lands could be used for growing crops, grazing animals, and collecting wood, so they were more than wild nature; they were a source of sustenance and income. Such lands were distinct from the common areas owned by the king in that they were not, in fact, open to all people. Rather, these lands were a community asset and accessible only to members of the village.

In the New World, many early settlements also instituted common lands (the Boston Common was once a shared sheep pasture). Further, the distinction between *res communes* and *res publicae* is kept alive in a judicial concept known as the Public Trust Doctrine. This doctrine says that, while legal title to rivers and shorelines might reside with the state, government merely holds such title “in trust” for its people who are the beneficial owners. A few state constitutions say this explicitly, including Hawaii’s, which declares, “All public natural resources are held in trust by the State for the benefit of the People.”

The U.S. Supreme Court has upheld the Public Trust Doctrine on numerous occasions. Says University of Texas law professor Gerald Torres, “The beneficial interest in any *res communes* is held by the people in common. The state does not own a river or the sky like it owns the furniture in the state house. The power of the government to divest the people of their common interest is limited. Even where such a divestiture is justified, the proceeds of that transaction belong to the people.”<sup>4</sup>

## Practically speaking, there are three possible beneficial owners of America’s portion of the sky: private corporations, the federal government, and citizens through a trust.

Corporate ownership is not as unlikely as it might seem. U.S. history is marked by numerous giveaways of common assets to private corporations, from land grants to railroads in the 19th century to spectrum to broadcasters within the last decade. The amount of scarcity rent that flows to these fortunate private entities is enormous.

A standard argument used to justify such largesse is that, in exchange for beneficial ownership of common assets, the receiving corporations deliver a quid pro quo of public value: they build railroads or transmit sharper TV images. The public thus gets a return on its in-kind investment, making the deals at least arguably fair.

Whether past in-kind investments of this sort were good deals for the American public is debatable. If measured by the rigorous yardsticks of Wall Street, most probably weren’t. (Are sharper TV pictures worth \$70 billion?) But there is no doubt that a similar gift of atmospheric carbon absorption capacity to private corporations would be a terrible investment. There is nothing the public could expect in return; such a gift would be a pure handout.

The argument for federal ownership of carbon absorption capacity is stronger than the case for corporate ownership. Presumably, the federal government represents the public interest, and, therefore, its ownership of the sky would, ipso facto, serve the public interest.

This presumption, however, is arguable. **The historical record suggests that the federal government has not always managed common assets in the public interest. To the contrary, it has often disposed of valuable common assets (land, minerals, timber, water, and spectrum) at far below market value.**

Further, even if the government did, in this case, demand fair market value for atmospheric carbon absorption capacity, only half of the problem would be solved. While an appropriate amount of scarcity rent would go into the U.S. Treasury, there is no assurance that it would come out—or that if it did that it would be equitably distributed.

It is possible, of course, that equitable allocation of federally collected atmospheric scarcity rent could be achieved through routine appropriations and/or tax cuts. But winning a one-time battle over property rights (where the issue is “one person, one share”) is one thing; winning repeated and obscure battles over annual expenditures and the tax code is quite another. It makes sense to fight that one-time battle and to mandate an enduring and equitable distribution of atmospheric scarcity rent.

The third option for beneficial ownership of America’s portion of the sky is that a citizens’ trust. In 1998, the Corporation for Enterprise Development (CFED) proposed creation of a U.S. Sky Trust to capture atmospheric scarcity rent on behalf of all citizens

<sup>3</sup> Institutes of Justinian, 1.8.2, as quoted in Lee Hargrave, “The Public Trust Doctrine: A Plea for Precision,” 53 Louisiana Law Review 1535 (May 1993), note 14.

<sup>4</sup> Memorandum prepared for the Corporation for Enterprise Development, August 1999.



## About how the U.S. Sky Trust will directly impact American households. . .

Estimating the scarcity rent in a free but capped market for carbon emissions requires a number of assumptions about which there is considerable uncertainty. Such assumptions include, but are not limited to: consumer response to rising prices; levels and timing of emission caps; the rate at which energy technologies may change; and the degree to which permits for U.S. emissions can be acquired overseas.

Analyses of a free market for carbon emissions have been conducted by both the U.S. Energy Information Administration<sup>1</sup> (EIA) and DRI/McGraw Hill<sup>2</sup> (DRI), a private consulting firm. These analyses use a combination of econometric modeling and technical data about energy markets and technologies. Using different implementation dates and varying prices for carbon, EIA predicted an annual scarcity rent of \$386 billion while DRI's predictions range from \$140 - \$280 billion.

To translate overall scarcity rent into costs and benefits for households, Gilbert Metcalf of Tufts University estimated the effects of environmental taxes on American households<sup>3</sup> based on income level. If Metcalf's results are scaled to reflect the middle scarcity rent flow – or DRI's \$280 billion "base case" – additional costs incurred by American households as a result of higher prices range from \$1,325 to \$4,913. U.S. Sky Trust dividends paid per household range from \$1,996 to \$3,385. The net result is a gain of \$671 for households at the bottom ten percent of the income distribution and a loss of \$1,528 for the top ten percent.

Income Decile (lowest to highest income)	Costs from Higher Prices	U.S. Sky Trust Dividend Paid	Net Financial Impact on Household
1	1,325	1,996	+671
2	1,576	2,116	+540
3	2,118	2,341	+223
4	2,368	2,555	+187
5	2,642	2,692	+50
6	2,529	2,924	+395
7	3,161	3,109	-52
8	3,302	3,236	-66
9	3,773	3,335	-438
10	4,913	3,385	-1,528

<sup>1</sup> Energy Information Administration. October 1998. Impacts of the Kyoto Protocol on the U.S. Energy Markets and Economic Activity. SR/OIAF/98-03. Available at [www.eia.doe.gov/oiaf/kyoto/kyotorpt.html](http://www.eia.doe.gov/oiaf/kyoto/kyotorpt.html)

<sup>2</sup> Probyn, Christopher and Will Goetz, Macroeconomic Impacts of Greenhouse Gas Control Policies, presentation at The Climate Change Analysis Workshop, June 6, 1996, DRI/McGraw Hill

<sup>3</sup> Metcalf, Gilbert E. 1999. "A Distributional Analysis of an Environmental Tax Shift," National Bureau of Economic Research Working Paper 6546. Forthcoming, National Tax Journal.

equally.<sup>5</sup> Independently, in 1999, four economists at Resources For the Future (Raymond Kopp, Richard Morgenstern, William Pizer, and Michael Toman) advanced a similar plan, with modifications to assure an economically smooth phase-in.<sup>6</sup>

Both proposals cap total carbon emissions then sell (rather than give away) emission permits. Permits are sold to fossil fuel companies at the top of the carbon chain at the mine mouth, well head, or port of entry. These companies (about 2,500 in all) are required to own a permit for each ton of carbon they introduce into the U.S. economy. In the first year, there is a ceiling placed on carbon emissions at \$25 a ton (roughly 6 cents/gallon of gas); the ceiling rises at a pre-set rate for five years. Seventy-five percent of the revenue is paid in equal dividends to all citizens; 25 percent is deposited into a transition fund to assist workers and communities adversely affected by reduced carbon use. The transition fund's share decreases by 2.5 percent per year for ten years, at which point all revenue is paid out in individual dividends.

How much is the revenue (that is, the scarcity rent) likely to be? In the early years, when the market price of carbon emissions is temporarily capped, revenue from permit sales will be in the range of \$38 billion a year. Later, when price caps are removed, the revenue could be hundreds of billions of dollars per year.

Of course, fossil fuel prices will rise once markets reflect the true scarcity of sky. Every household will pay more for gasoline and other products that embody burnable carbon, a fact that naturally causes fear among politicians and the public. The antidote to higher prices, however, is the dividend paid from the scarcity rent to every American family—a predictable income stream that will offset the losses due to higher prices.

**If carbon emissions are limited, and given the current environmental crisis it stands to reason that they will be, consumers will pay higher prices whether or not there's a Sky Trust.** Higher prices result from atmospheric scarcity, not from the cost of carbon emission permits. The sale of permits merely captures the scarcity rent; it doesn't create it. Without permits and dividends, fuel companies will still raise prices but the scarcity rent will be a private windfall. With permits and dividends, scarcity rent will go to every household in America.

In this sense, the U.S. Sky Trust is a scarcity rent recycling machine. The algorithm driving the machine is: from all according to their use of the sky, to all according to their equal ownership of it. Those who burn more carbon pay more than those who burn less. Yet, as equal beneficial owners, every American receives the same income. This, households will come out ahead if they conserve but lose money if they don't. This isn't only fair; it's precisely the incentive needed to reduce pollution.

As it turns out, this shift of money from high to low carbon users also favors families with lower incomes. That's because poor families tend not to drive big cars, occupy big homes or fly around the world in jets. A study by economist Marc Breslow confirms this. Using Census Bureau and other government figures, Breslow found that, if you rank U.S. households by income, the bottom 60 percent would, on average, gain money with a Sky Trust, while the top 40 percent would lose.<sup>7</sup>

<sup>5</sup> Barnes, Peter. Corporation for Enterprise Development, 1997 Entrepreneurial Economy Review, pp. 22-27. Washington DC, 1998.

<sup>6</sup> Kopp, Raymond, Richard Morgenstern, William Pizer and Michael Toman, "A Proposal for Credible Early Action in U.S. Climate Policy," Resources for the Future policy paper, February 1999.

Available at <http://www.weather.vane.rff.org/features/feature060.html>

<sup>7</sup> Breslow, Marc, and Peter Barnes, "Pie in the Sky," a paper submitted to the Natural Assets Workshop in Santa Fe, NM, on January 21, 2000.

**The U.S. Sky Trust would be neither a government agency nor a private corporation. It would be a civic institution embodying American common ownership of a shared inheritance.**

An independent board of trustees would manage carbon flow through our economy, much as the Federal Reserve manages the money flow. It might be compared to the Alaska Permanent Fund, which distributes dividends from Alaska's oil properties on a one citizen, one share basis. In 1999, the dividend was \$1,769.84 per Alaskan.

The time is right for a U.S. Sky Trust.

A U.S. Sky Trust costs the government nothing. Sky Trust will generate dividends for all Americans, yet take not a penny from the federal budget. It will help families, yet require no new taxes. It is market driven and will open new business opportunities and secondary markets. It won't bloat the federal bureaucracy. It will protect air and stabilize the climate.

Politically, a U.S. Sky Trust can have broad appeal. It can appeal to conservatives because it's market-based and gives money to people rather than to government. It can appeal to liberals because it benefits low- and middle-income households and from protects the environment.

A U.S. Sky Trust can be launched in a low-risk way. Sky Trust is designed with a five-year demonstration period. During these first five years, the price of carbon storage is capped at the equivalent of 6 cents/gallon of gas. Its cap rises at a single-digit rate for the next four years; all the while, of course, paying dividends. In addition, billions of dollars will capitalize a transition fund to help coal miners, farmers, and others directly affected by a shift from carbon burning. If, after five years, Sky Trust has not shown signs of success, it can be fixed or simply let lapse.

## About the Alaska Permanent Fund. . .

In 1976, Alaskan Governor Jay Hammond proposed, the Alaskan Legislature passed, and the Alaskan people ratified a constitutional amendment to create the Alaska Permanent Fund. The amendment sets aside a percentage of certain mineral revenues paid to the State to be deposited into a public savings account to be invested for the benefit of current and future generations of Alaskans. The Fund received its first deposit of \$734,000 in dedicated oil revenues in 1977 and has grown over time to more than \$27.1 billion. In fact, it is one of the 100 largest investment funds in the world.

A key aspect of Alaska's Permanent Fund is the dividend program, which distributes a share of Fund earnings to every Alaska resident each year. All Alaskans who have been residents for at least one year are treated exactly the same: children or adults, young or old, rich or poor, urban or rural; all Alaskans share equally in the Fund.

The dividend program now in effect was enacted in 1982 and the first dividend - \$1,000 - was issued the same year. The size of each year's dividend is calculated using a formula that takes into account the Fund's performance over the previous five years<sup>1</sup>.

18 Years of Dividends				
<b>1999</b>	<b>1998</b>	<b>1997</b>	<b>1996</b>	<b>1995</b>
\$1769.84	\$1540.88	\$1296.54	\$1130.68	\$990.30
<b>1994</b>	<b>1993</b>	<b>1992</b>	<b>1991</b>	<b>1990</b>
\$983.90	\$949.46	\$915.84	\$931.34	\$952.63
<b>1989</b>	<b>1988</b>	<b>1987</b>	<b>1986</b>	<b>1985</b>
\$873.16	\$826.93	\$708.19	\$556.26	\$404.00
<b>1984</b>	<b>1983</b>	<b>1982</b>		
\$331.29	\$386.15	\$1000.00		

1 Information from the Alaska Permanent Fund Corporation. Available at [www.apfc.org](http://www.apfc.org).

## The U.S. Sky Trust won't make anyone a millionaire but it does have important long-term implications.

As the 21st century progresses, other gifts of nature will become scarce. The Sky Trust would establish a principle that the scarcity rent from commonly inherited assets belong to all Americans. Perhaps a portfolio of dividend-paying trusts might one day be a birthright of all Americans, extending the notion of one person, one vote, to one person, one share.

Viewed in this way, the establishment of a U.S. Sky Trust would be an historic event, comparable to the Homestead Act of 1862, the Federal Reserve Act of 1913, and the Social Security Act of 1935. Like the Homestead Act, Sky Trust would create a new class of property owners because, in effect, every citizen would have an equity stake in the sky. At the same time, it would create a board of trustees to manage the carbon flow through our economy, much as the Fed manages the money flow.

And it would define a new algorithm for moving money within our economy: from all according to their use of a commons, to all according to their equal ownership.

The importance of this new algorithm can't be overstated. It differs significantly from two other algorithms Americans are familiar with: public assistance and Social Security. The underlying formula for public assistance is, from all according to their tax liability, to all according to their need. The underlying formula for Social Security is, from all according to their wages, to all according to their disability and longevity. These algorithms, although broadly accepted, are not without controversy. Further, each has been

stretched to its limit—public assistance because Americans don't like “taxing Peter to pay Paul,” and Social Security because Americans are at the height of their tolerance for payroll taxes.

The new Sky Trust algorithm, by contrast, has room to grow. It channels money from over-users of nature to under-users; as natural assets become more scarce, more money can flow through this system. Moreover, it's hard to argue against the Sky Trust's algorithm. That consumers should pay for what they use is among the oldest principles of markets; here the principle is simply extended to an asset that, foolishly, has previously been priced at zero. Similarly, that dividends should be paid to owners is a sacred tenet of capitalism; the only novel notion of the U.S. Sky Trust is that of equal and universal ownership of a common asset.

But how else could ownership of the sky be divided? It may be convincingly argued that human-made assets should be unequally distributed in order to encourage individual effort and reward success. It cannot be argued that ownership of the sky should be unequally divided. The atmosphere is a purely inherited asset, and not from anyone's parents, but from the common creation.

In sum, the U.S. Sky Trust would marry a cap-and-trade system for rationing a scarce natural asset with a trust for preserving common ownership. It's equitable, ecological and market-based. It's politician- and customer-friendly. That, ultimately, is the elegance of the Sky Trust.

## There are, of course, those who will suggest that any policy to limit carbon burning will cause great harm to the American economy. Our Gross Domestic Product (GDP) will shrink, consumers will be poorer, and hundreds of thousands of workers will lose jobs.

We don't argue that there'll be no pain; change always causes pain. Whenever a new industry emerges, or an old one fails, some people gain and others lose.

The warming of the Earth's atmosphere will surely cause pain. At the extreme, it will cause a large number of people to lose their homes, health, and livelihoods. At a minimum, it will cause a smaller number of people to lose jobs and money. The politics of climate change is thus, to a great degree, the politics of managing pain. The U.S. Sky Trust doesn't deny this. On the contrary, it consciously seeks to minimize the pain from climate change and to share what pain there is as equitably as possible.

Over the long run, the key to minimizing pain is to minimize the geophysical effects of climate change—rising sea levels, extreme weather, the spread of tropical diseases to now-temperate zones. That can be accomplished by cutting carbon burning as quickly as possible.

The short run task is different: it is to minimize the economic effects of reduced carbon burning. The U.S. Sky Trust approaches this task in three ways:

First, it relies on gradualism. Given time and forewarning, the U.S. economy is amazingly resilient. What caused gas lines in the 1970s (and could cause them again in the future) is a sudden leap in fossil fuel prices. The five-year phase-in of Sky Trust is designed to avert such circumstances. During this period, carbon emission prices will start low and rise gradually. Investments in conservation and new energy technologies—not to mention purchases of more efficient automobiles—can be planned accordingly.

Second, a Sky Trust uses scarcity rent to pay dividends to all Americans. Absent an offset to higher carbon prices, Americans will lose buying power. With dividends, most Americans are protected. In fact, a majority of Americans are more than protected—they come out ahead even without taking steps to conserve. By conserving they can gain even more.

Third, a Sky Trust provides special assistance to those most directly affected by reduced carbon burning. To the extent that anyone can be fairly compensated for losing his or her livelihood, the transition fund can do it. A rough estimate is that the fund will have \$8 billion a year for ten years. Some would go to laid-off workers, some to low-income consumers, some to coal-mining communities, some to cities for mass transit. Federal, state and local governments would make these choices.

What about the American economy as a whole? The Sky Trust will cause no macroeconomic harm. The freeness of air, far from being typical, is an anomaly. Pricing sky in a parallel way to everything else will have little impact, especially if pricing is gradually phased in.

Further, carbon-related econometric studies are reassuring. Some predict a small, brief slowing in GDP growth due to higher carbon prices but none predict a large or a long lag. One even predicts a small positive impact as higher carbon prices spur innovation and new investment.

Twenty years ago, utilities projected large increases in the amount of electricity Americans would demand and, hence, of the fuels that would need to be burned. With nudging from regulatory commissions, however utilities built fewer power plants and invested in conservation instead. They wound up with lower cost structures and higher profits. And the U.S. economy boomed.

If electric utilities—who are in the business of burning carbon—can make more money by burning less

carbon, surely other businesses can do so, too. What's required is a combination of incentives and ingenuity. The U.S. Sky Trust provides the former; American management and workers provide the latter.

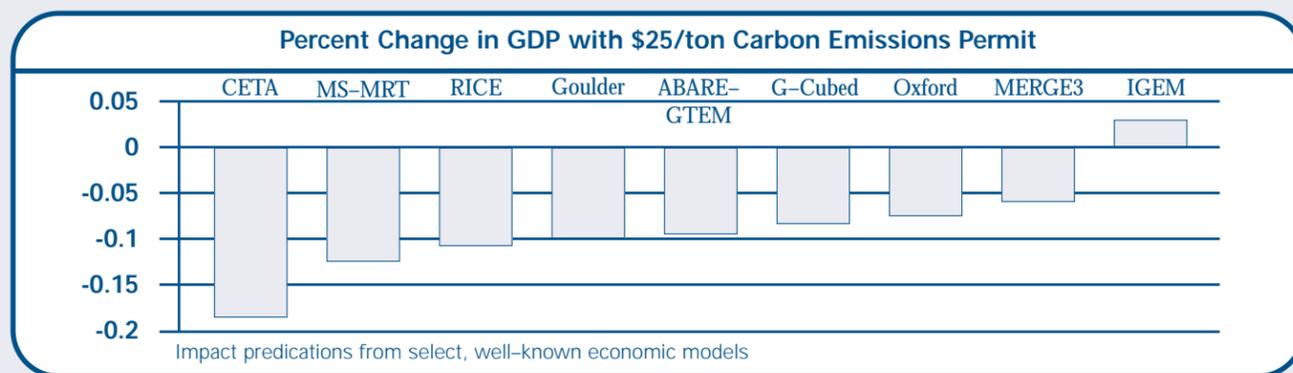
Who doubts that, in the future, America will continue to adapt and grow? There'll be less carbon burning and more e-mailing, less of an economy of things and more of an economy of mind. There'll be growth of a different color, but growth nonetheless. And the U.S. Sky Trust will spur it.

### About Impact on the GDP . . .

The U.S. Sky Trust ensures a favorable ratio of current costs to future benefits because it harnesses the free market to reduce carbon emissions. Because the Sky Trust is comprehensive, covering virtually all sources of carbon emission, it would achieve large reductions in emissions without singling out any one economic sector.

Initial economic modeling of a similar plan strongly confirms a conclusion of small economic impact. One of the best available models, that of Stanford Professor Lawrence Goulder, suggests a loss of about one tenth of one percent of GDP despite the dramatic emission reductions. Most other models produce similar predictions.

Furthermore, the U.S. Sky Trust proposal contains additional fail-safe features to guard against larger-than-intended economic consequences. A permit price ceiling ensures that if emissions reduction proves to be more expensive than forecasted, the economy will be protected from excessive cost or disruption. Further, the revenue recycling component provides additional insurance against macroeconomic disruption.



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