



[Richard L. Sandor, Ph.D, biography](#)

[May 23, 1997 – Introduction to Catastrophe-Linked Securities](#), Lehman Brothers

Catastrophe-linked securities, an emerging class of structured insurance risk products, offer returns that are linked to the occurrence of catastrophic events such as earthquakes and hurricanes . . .

[September 16, 1997 – The Norman Transcript: Economic Speculation Seen as Solution to World’s Woes](#)

Sandor helped establish futures contracts based on tradeable sulfur dioxide emission allowances established by the 1990 Clean Air Act. The Act required industrial plants to cut by 50 percent the emissions responsible for acid rain. Plants that did a better job at cleaning up their smokestacks were allowed to transfer or sell their emissions allowances to other plants that were not as efficient. A commodity was formed.

[September 16, 1997 – Oklahoma Daily – Economist discusses environmental solutions](#)

"Right now we are all witnessing the formation of a market in the United States," Sandor said. "We're about one-third or 40 percent of the way there."

Sandor chaired the Clean Air Committee of the Chicago Board of Trade between 1991 and 1994. The committee directed the establishment of the first-ever spot and futures markets in **environmental contracts**.

[October 29, 1997 - Dallas Morning News - Commodity futures expert named to CSW Board](#)

"As utilities prepare for electricity deregulation"

[March 27, 1998 – Wall Street Journal – Bids for Emission Allowances at Auction Surprise Brokers as Premiums Are Paid](#)

Bids for allowances . . . Cantor Fitzgerald Inc. won 73.3% of the spot allowances and 99.9% of the future allowances and paid almost \$27 million for them. Cantor said it was bidding on behalf of four clients, but the firm wouldn't reveal their identities.

The auctions is part of the **U.S. Environmental Protection Agency plan to reduce emissions of sulfur dioxide**, which cause acid rain. **Ownership of allowances let the owner emit sulfur dioxide.** The allowances can be traded among participants on the Chicago Board of Trade.

The buyers, such as electric utilities, that cut their emissions below the number of allowances they hold can trade allowances, sell them in the market or at auction, or hold on to them to cover future emissions. **If emissions exceed allowances, the utility has to pay a penalty and give up allowances.**

Carlton Bartels, managing director of commodities for Cantor Fitzgerald . . .

[June 15, 1998 - Wall Street Journal - Richard Sandor comments on recent development in the reinsurance industry](#)

An article by Patrick McGeehan . . . "Investment Bankers Are Moving Fast to Offer Securities Backed by Pools of Insurance Policies", June 15, 1998) discussed the recent developments in the reinsurance industry, focusing on **Lehman Brothers' creation of a reinsurance subsidiary** that will write policies to cover a variety of risks corporations face and package them for resale to investors.

Reinsurance - a market where **bonds are backed by pools of insurance policies** - is considered by many to be the next frontier of capital markets. It has been **attracting a lot of attention from investment banks**.

. . . collateral was a pool of policies purchased by corporations or insurance companies to protect them from some of the risk they faced from catastrophes

We are on trend that is **similar to the securitization of mortgages**," Dr. Sandor told the Wall Street Journal. He noted that the market for bonds backed by mortgages also started out with over-the-counter trading of derivatives and has since exploded.

March 25, 1998 – CBOT/EPA host sixth annual SO₂ Emission Allowance Auction: CBOT positioned as Environmental Exchange for the Next Generation

The **auction is part of the EPA's program to significantly reduce acid rain by cutting utility SO₂ emissions in half nationwide. The auction gives power plants, brokers, and private citizens anywhere in the world the chance to buy and sell SO₂ allowances.**

"As part of a larger scope of environmental challenges linked to market-based solutions, the CBOT reaffirms its commitment as the environmental exchange of the 21st century."

Richard L. Sandor, CBOT Second Vice Chairman and Chairman of the Exchange's New Products Committee said, "As environmental problems continue, the CBOT has taken on this significant responsibility, and now we conduct emission allowance auctions and trading recyclable products, with the formation of the Clean Air Committee. As an Exchange, we began our environmental pursuits six years ago, and are convinced the Exchange provides the only such public price discovery mechanism."

In November 1997, the CBOT approved the listing of Commonwealth Edison Hub Electricity futures and options, and in February 1998, the CBOT approved an electricity contract with the Tennessee Valley Authority.

April 20, 1998 – Barron's article calls Richard Sandor the "progenitor of banking"

"Sandor pathbreaking role as financial innovator"

Mr. Mayer calls Dr. Sandor the "progenitor of banking". Sandor's initiatives in the 1970s created better mechanisms for pricing the underlying risk of long-term contracts. By making use of **new financial derivatives** in their daily operations, banks have been able to diversify their portfolios and offer new services. The author reminds us of the **more recent offsprings of this idea, such as catastrophe bonds ("CATs"), now widely used in the reinsurance business.**

The traditional image of banking as merely earning income from the loans it makes has been challenged by the continued growth in fee-based services performed by the big players in the industry.

. . . gigantism really profitable in banking is the homogenization of the instruments the banks create, acquire and trade". These instruments have enabled banks to blend the lines between lending, investing and insuring.

"The progenitor of banking is not a banker at all but an academic turned commodities trader: Richard Sandor, who in the 1970s persuaded the Chicago Board of Trade to offer a contract to buy or sell Treasury-bond futures."

"Sandor dropped the pebble that rolled and rolled, **eventually generating an avalanche of derivative instruments**. These instruments recognize and price the options embedded in all long-term financial contracts, and **in effect destroy the long-standing distinctions among kinds of loans, varieties of investment and different forms of insurance**"

But, according to Mayer's Barron's article "Apples Meet Oranges": "The change that has made **gigantism really profitable in banking is the homogenization of the instruments the banks create, acquire and trade**". These instruments have **enabled banks to blend the lines between lending, investing and insuring**. The article points to Richard Sandor's innovative work in the 1970s. Mayer writes:

"Sandor dropped the pebble that rolled and rolled, eventually generating an avalanche of derivative instruments. These instruments recognize and price the options embedded in all long-term financial contracts, and in effect destroy the long-standing distinctions among kinds of loans, varieties of investment and different forms of insurance"

[December 1999 – The World According to Richard Sandor](#) *****

Richard Sandor has been called "the father of financial futures" ever since the 1970s, when he helped develop the Chicago Board of Trade's Treasury futures contract. A former professor at the University of California at Berkeley and a lecturer at Stanford, he has held senior positions at Kidder Peabody, Drexel Burnham Lambert, Banque Indosuez and the Chicago Board of Trade.

Derivatives Strategy: Someone recently sent me an **ancient clipping from the June 25, 1970**, Financial Times in which you're quoted as envisaging "the exchange of the future" **hooked up by a "vast communications network" of computers with split-second order execution**. It's safe to call such an idea prescient.

... But electronic trading has allowed us to enter what could be termed a **"deconstructivist" phase, in which there can be hundreds of thousands of small, Internet-based markets. We're seeing a vast change, whether we're talking about electricity, power, cement, steel or mortgages.**

The next financial revolution will be in the **convergence of the financial markets and the environment.**

... Altra Energy, trades spot propane, natural gas and electricity. It did \$6 billion worth of transactions in 1998, and it controls 40 percent of the liquid natural gas market. **Now it's been launched as an Internet-based exchange for trading electric power in competition with Bloomberg**, and it already has couple-thousand registered users worldwide for its products.

The environmental area has interested me since the first Earth Day in Berkeley in April 1970.

I gave a paper on this in Rio at the Earth Summit in 1992, asking the question: "Could you develop market-based solutions to this major environmental problem?"

ZAPCO has a low-tech business. It sinks pipes into landfills and recovers the methane, which is a greenhouse gas that's 21 times more potent than carbon dioxide. **ZAPCO burns the methane and sells the power to local electricity producers**. So ZAPCO is simultaneously cleaning up the landfill and developing sustainable power, because the landfill continues to produce methane. This reduces the amount of greenhouse gas in the atmosphere, and **that reduction is being purchased by Ontario Power.**

. . . Gas, electricity, emissions, power—the whole works. The Internet allows us to trade electricity in a thousand different locations efficiently, just as it will allow us to trade weather derivatives in 50 or more cities.

In in Moscow recently, giving out carbon allowances and creating a fictitious market. Can you imagine the kind of surrealism this created, running **simulated trading of environmental derivatives in a U.N.-based Moscow-located forum?**

[October 23, 2000 \(archive date\) Environmental Financial Products LLC About Page](#)

Environmental Financial Products L.L.C. specializes in developing and trading in new environmental, financial, and commodity markets. Environmental Financial also designs risk management and **hybrid financial instruments that enhance the interrelationships between the capital, commodity, and environmental markets. Richard L. Sandor, Ph.D. is Chairman and Chief Executive Officer of the firm**

Environmental Financial brings a unique perspective that has been developed **by acting as both market designer and market participant.** Members of the Environmental Financial team played a lead role in the design and implementation of the SO2 emission allowance market and have traded SO2 and CO2 offsets as both principal and agent. **The firm also provides advisory services focused on monetizing emission reductions, energy efficiency improvements and carbon sequestration, and managing exposure to environmental, energy and financial risks.**

Environmental Financial works with a broad spectrum of organizations. **The firm is Senior Advisor to PricewaterhouseCoopers LLP, the world's largest consulting firm.** Environmental Financial's principals have been consultants, board members or advisors to a diverse array of corporations, governments and non-governmental organizations, **including the government of Canada and Australia's Greenhouse Challenge Office, ARCO in the energy sector, Central & SouthWest and Northeast Utilities in the utility sector, Jet Propulsion Laboratories, the Center for Sustainable Development in the Americas and the International Council for Local Environmental Initiatives.**

Organization profile – [Center for Sustainable Development in the Americas](#) - **UNDRR – disaster risk reduction *******

[October 2001 – Environmental Finance – DJSI World: two years on](#)

Dow Jones Sustainability World Index

SAM Group – Sustainable Asset Management – based in Zurich

[Note: tribute to Carlton Bartels, Cantor Fitzgerald, killed on 9/11/2001 – WTC]

[June 29, 2002 - Dr. Richard Sandor, Statement to the US Senate](#) Committee on Environment and Public Works

Context: The debate over appropriate actions to address the risks arising from changes in the Earth's climate—the “greenhouse effect”—suffers from two major information gaps. The first is a lack of consensus regarding the damages that could occur . . . the costs of inaction and the benefits of taking mitigation actions are uncertain. The second information gap is lack of understanding of the monetary costs associated with undertaking mitigation . . . The absence of hard, proven data on greenhouse gas mitigation costs reduces the quality of the climate policy debate.

This report presents a feasibility analysis and **initial architecture for a voluntary pilot greenhouse gas emissions trading program** that would be launched in the Midwest and expanded over time. The objectives of the pilot program—hereafter called the **Chicago Climate Exchange (CCX)**—are . . .

See Appendix A - Participants in the design

CEMEX

Ducks Unlimited

Ford Motor Company

FirstEnergy, headquartered in Akron, Ohio, is a **registered public utility holding company** whose subsidiaries have annual revenues of more than \$12 billion, and electricity sales of approximately 124 billion kilowatt-hours. Its **seven electric utility operating companies--Ohio Edison, The Cleveland Electric Illuminating Company, Toledo Edison, Metropolitan Edison, Pennsylvania Electric, Pennsylvania Power and Jersey Central Power & Light--**comprise the nation's fourth largest investor-owned electric system, based on serving 4.3 million customers in a 36,100-square-mile service area that stretches from the Ohio-Indiana border to the New Jersey shore.

Pinnacle West Capital Corp: Based in Phoenix, Ariz., **Pinnacle West is the parent company of APS and Pinnacle West Energy. APS is Arizona's largest and longest-serving electric utility, serving more than 857,000 customers, and Pinnacle West Energy is the company's unregulated wholesale generating subsidiary.** Among the utilities listed in the S&P 500, Pinnacle West is ranked in the top 10 percent for environmental performance by an international investment advisory firm. The Company also is ranked in the top 10 percent by Fortune magazine for total shareholder return over the last five years.

Swiss Re: Founded in 1863 in Zurich, Switzerland, Swiss Re is the world's second largest reinsurer, with roughly 9,000 employees and gross premiums in 2000 of CHF 26 billion (USD\$15.3 billion).

See Appendix B - Biographies of the CCX Advisory Board

David Boren

Jeffrey E. Garten - held senior economic posts in the Ford and Carter administrations; undersecretary of Commerce for international trade - Clinton Administration. Lehman Brothers - Asian investment banking;

Blackstone Group

Joseph P. Kennedy II

Jonathan Lash, President of World Resources Institute (WRI), leader - PCSD, Vermont

Dr R. K Pachauri, Director-General of Tata Energy Research; Vice Chairman of the Intergovernmental Panel on Climate Change (IPCC)

Mary L. Schapiro, President of NASD Regulation, INC.

Maurice Strong

Sir Brian Williamson, Chairman, London International Financial Futures

[September 5, 2008, updated March 13, 2008, Energy Q&A Climate-Exchange Founder Richard Sandor](#)

Barack Obama and John McCain agree on one thing: the need to cut carbon emissions. With both candidates backing that idea, smoke-spewing factories and power plants can expect big changes soon. Some have prepared by joining the Chicago Climate Exchange, a voluntary market that functions like the NASDAQ but **trades emission rights instead of Google stock** . . . Richard Sandor, an economist who's spent decades at the intersection of environmentalism and finance, founded the CCX—the world's first, and America's only, carbon market—in 2003.

How does the climate exchange work?

The CCX is what is called a cap-and-trade system: there is a cap on the total amount of emissions. In our case, companies have to reduce emissions in the aggregate by 6 percent between 2000 and 2010. **If any particular company reduces emissions more than that, they are free to sell those extra credits on the market.**

Who's involved with the CCX?

We have 17 percent of the Dow Jones industrial average, including IBM, DuPont, United Technologies, Intel. We have 11 percent of the Fortune 100, including Ford Motor Co., Honeywell and International Paper. We have about 25 percent of the top power companies in America, including AEP, the biggest burner of coal in the Western hemisphere. We also have eight cities, from Chicago to Portland, and eight universities from Tufts in the east to UC San Diego in the West.

. . . There are also many companies who just want to be involved in the process—if you're not at the table, you're on the menu.

. . . Some companies, like Ford, joined because they knew they were going to be involved in other cap-and-trade systems around the world—they have manufacturing plants in Manchester and Marseilles and Japan, and they were operating in countries that were subject to the Kyoto Protocol [whose signatories must start cap-and-trade systems by 2008].

. . . all three candidates—Clinton, Obama and McCain—all favored a national cap-and-trade system, the price of carbon went from \$1.90 to \$7.

Economists like Joseph Stiglitz and Greg Mankiw say cap-and-trade is inherently susceptible to corruption.

The first cap-and-trade program done on a massive scale came after the Clean Air Act of 1990, and required a 50 percent reduction in sulfur dioxide over a 10-year period. [Thanks to the economics of cap-and-trade,] the EPA estimates the current system costs \$1 [billion] to \$3 billion a year, as opposed to an initial estimate in the tens of billions. And the **medical benefits associated with reduced health-care costs due to less lung disease will reach \$120 billion a year in 2010. I know of no other program that has achieved this kind of cost-benefit ratio.**

Wouldn't a straightforward tax be simpler?

I'd rather have the price set by the participants on a daily basis. I also think the cost of administering and collecting taxes would far outweigh the costs associated with the market. And **the impact of a carbon tax will depend on how good your accounting firm is.**

Most of the growth in carbon emissions is going to be in China and India. Will they have carbon trading soon?

Companies there seem much less interested in the idea. **We have five Chinese members [on the CCX], and we have biogas projects in the poorest sections of India, in Kerala—**

But can you get the Chinese and Indian governments to impose cap-and-trade?

I think it's going to happen the other way around: the private sector will lead and the government will ratify. **We're now in the process of forming an Indian climate exchange. We've signed a memorandum of understanding with the China National Petroleum Corp.** I don't think that India and China are quite as behind as many would have us believe, and I don't think Europe is quite as far ahead.

. . . I believe that's the model for a worldwide solution to global warming. I think it will follow the examples of past industrial and financial innovation, and that within 20 years it will have evolved into a worldwide system.

[September 9, 2008 – Environmental Financial News Archive](#)

1997 – 2001 Article archive

[October 2009 – On the Barricades of Cap-and-Trade, Newsletter, Risk Professional](#)

“Carbon touches everybody. Ultimately carbon will be the world’s biggest commodity.”

[December 2009 – The Green Money Machine](#): Politicians, Philanthropists and Financiers **Collude** over “Cap-and-Trade”

Very important article – too important to take excerpts

[January 6, 2010 – Environmental Financial – News Archive](#) (Note: try to find this page in the internet archive. You won't find it because several years of their archive files have been scrubbed).

List of articles about Environmental Financial, Richard Sandor, etc.