ENVIRONMENTAL DEFENSE FUND
finding the ways that work

May 9, 2008

Kevin Kennedy
California Air Resources Board
1001 "I" Street
Sacramento, CA 95812

Re: Cost Containment Comments for AB32 Economic Analysis Working Group

Dear Mr. Kennedy,

Thank you for accepting input on cap-and-trade design for the AB32 Scoping Plan. As co-sponsor of AB32, California's Global Warming Solutions Act of 2006, Environmental Defense Fund remains committed to working with agency staff and all stakeholders as we plan to meet greenhouse gas emissions reductions goals. Please accept this comment letter in response to three questions posed by staff at the April 25th workshop on cost containment.

1. **What type of cost containment mechanisms should California consider for a potential cap-and-trade system?**

Examination of types of costs considered: Environmental Defense Fund supports the examination of both private costs and total social costs when considering containment mechanisms. The definition of "cost containment" portrayed in the CARB staff white paper focuses our thinking to allowance prices, the embodiment of the private costs of regulatory compliance. This attention is placed correctly since private entities will be required to hold emissions allowances in cap-and-trade. However, CARB should also consider controlling total social costs within AB32. Isolating only private costs is dismissive of the real and significant costs that slow action and insufficient emissions reductions to avoid climate change create. To this point, Environmental Defense Fund supports the use of a multi-sector cap-and-trade program to get fast and effective GHG reductions and minimize total social costs. Other regulatory approaches without cap-and-trade are likely to be costlier and slower,[1] lack the surety of environmental performance necessary within the timeline to stop global warming.

[1] This finding has been confirmed in study after study, including E-DRAM and BEAR modeling sponsored by CARB in 2007 (See the findings of the macroeconomic analyses sponsored by the Economics Subgroup of the Climate Action Team). Similarly, modeling by CRA International and the Electric Power Research Institute also find that, relative to other policy approaches, cap-and-trade will minimize the costs of meeting GHG reductions goals (See An Updated Macroeconomic Analysis of Recent California Climate Action Team Strategies , October 2007. Larry Williams, EPRI. "Market-based strategies such as cap-and-trade programs cost California less than command-and-control strategies" pg. VI.)

Price Safety Valves (floors and ceilings) must not be used.

AB32 and Executive Order S-3-05 set economy-wide caps for 2020 and 2050 that must be etched in stone since they are established to reduce future impacts and associated costs of climate change. We also expect to enjoy many benefits from early action[2] that ought to be implemented as quickly as possible. "Safety valves" have been suggested as mechanisms to provide ceilings for allowance prices, but a more appropriate analogy might be pricking an inflated raft with a pin. In addition to undermining entrepreneurial ambition, artificial market fissures like price valves will violate the economy-wide cap and potentially sink California's economy if emissions are allowed to exceed the cap and fail to avoid the worst, and most costly, effects of climate change.

In addition to violating the cap, safety values can be rejected because there are many better ways to constrain the private costs of GHG emissions reductions. The many options, listed and discussed below, also obviate the need to establish allowance price floors or ceilings. These options include:

- Broad and robust cap-and-trade market, including linkage to other GHG allowance markets
- Flexible compliance mechanisms, including banking, borrowing, adjustable compliance periods, and allowance trading
- Institutional arrangements that provide for oversight and "market makers"
- Careful allocation of allowances
- Third party financial service providers
- Using reliably verified offsets
- Using staggered compliance periods
- Linkage to other carbon credit markets or cap-and-trade programs

A broad and robust cap-and-trade market, including linkage to other GHG allowance markets, provides cost-containment and obviates the need for disruptive price floors and ceilings.

In an economy-wide GHG cap-and-trade regime, the extensive marketplace diffuses the impacts of individual actions and thus protects against manipulation or other antisocial, market disrupting behavior. The economy-wide marketplace will also eliminate the need for cost containment because it will create entrepreneurial enthusiasm to search for and invent new methods and products that minimize GHG emissions. Most important, a broad cap-and-trade will maximize opportunities to reduce emissions cheaply. With these many benefits in mind, EDF concurs with the Cap-and-Trade Subgroup of the Climate Action Team in calling for a broad cap-and-trade.

Broad marketplace participation and diversification will do far more to protect against allowance price volatility than price floors or ceilings, and will be more effective in the long term than presetting or benchmarking quantitative limits on offsets. Price floors and ceiling do nothing to limit the periodicity of allowance price changes, though they may trim amplitudes and troughs. Volatility is really a measure of the frequency and extent of variation, not the peaks or valleys.

[2] EDF Benefits of Action Report for Florida; BEAR modeling results from Hanneman, Holst, Kammen at UC Berkeley; Stern Report, McKinsey Report

Here again, market breadth diversifies risk, broadens the number of permits and participants, and thus insulates against shocks.

Though price floors and ceilings ensure price minimums or maximums, respectfully, they do little to reduce fluctuations. Similarly, increasing the number of sectors within cap-and-trade expands available control options, diversifies to effort, and facilitates the identification, development and implementation of low-cost solutions. An economy-wide cap-and-trade will be the best way to guard against price shocks caused by one sector.

Like an individually broad cap-and-trade, linking the California program to other GHG emissions trading systems will further protect AB32 allowances from price volatility. Though this linking will have cost containment and other benefits, it also creates de facto harmonization with the policies of those other markets[3], so care should be taken to assess the policies of other trading systems before linking to the AB32 system. Linking is discussed in more detail below.

Flexible compliance mechanisms, including banking, borrowing, staggered compliance periods, and allowance trading should be available.

Key provisions of cap-and-trade design that facilitate lower compliance costs will provide "flexibility" through mechanisms such as banking, borrowing and adjustable, but well-defined compliance periods. These features allow for inter temporal trading, thereby enabling regulated entities to make "lumpy" decisions work for smooth compliance pathways. Banking has the additional environmental benefit of getting reductions sooner.

Another aspect of flexibility pertains to trading. Though perhaps so obvious as to be left unstated, trading allows regulated entities to utilize low-cost opportunities for reducing emissions.

Careful allocation of allowances is an important cost containment mechanism that must be used at the outset of the market.

Allowance allocation is another way to manage the cost implications of AB32. The cost burden borne by any one sector can be alleviated by granting it relatively more allowances under the cap. And while there are strong arguments for auctioning at least a portion of allowances, there is possibly good reason to administratively allocate some allowances, at least in the near term, to ensure that the cost of meeting the overall emission reduction goals are spread equitably throughout the economy. This reality is particularly acute in the utility sector where the "playing field" is not level since municipally-owned utilities face different rate pricing constraints than private load serving entities.

Revenues generated in an allowance auction can be used for a wide range of climate-related investments, such as energy efficiency and clean energy technology, and these investments should be made with the goal of minimizing future compliance costs and maximizing benefits to California. The Economic and Technology Advancement Advisory Committee (ETAAC)

[3] For an excellent discussion of the benefits and risks of linking GHG emissions trading systems, see Jaffe and Stavins, Linking Tradable Permit Systems for GHG Emissions: Opportunities, Implications and Challenges. International Emissions Trading Association, Nov. 2007.

provided excellent recommendations about ways to invest auction revenue for the benefit of Californians.

Encouraging third party financial service providers to participate will aid in cost containment.

Another way to manage allowance price uncertainty is to encourage participation in the carbon market by third party investors and third party service providers. Service providers enable the management of carbon emissions liability using simple insurance or more sophisticated financial mechanisms, such as derivatives, futures, forwards, swaps and options. Dr. Nathanial Keohane, Director of Economic Policy and Analysis at Environmental Defense Fund, provides a brief narrative of financial mechanisms for cost containment in cap-and-trade that is attached to this letter as Appendix A.

Setting rigorous standards and allowing the use of reliably verified offsets is important.

As discussed in a previous submission to CARB, Environmental Defense Fund supports the use of emission reduction offsets in an AB32 market system. Offsets must be developed using rigorous criteria to ensure the environmental integrity of what they represent.

The structure of the compliance period can be used as a cost-containment mechanism.

Recent attention has been given to the structure of AB32 compliance periods and whether a fixed, rolling or floating structure offers the most effective cost containment. This issue arises out of the desire to control costs by limiting the potential for market price manipulation and distributing the demand for emissions allowances over a sufficiently long time period. Environmental Defense Fund agrees that one of the potential effects of a market system is price fluctuations oriented around compliance dates. Staggering compliance dates is a relatively easy method to reduce the size of the potential market perturbation caused by common compliance period end dates. However, the desire to improve cost-effectiveness by staggering compliance periods must not undermine the transparency and administrative workability of an AB32 market.

Environmental Defense Fund strongly supports the development and use of compliance periods within the AB32 compliance framework that are established by the regulatory agency. Regulated entities must comply with the dates sets forth by the regulatory agency, and not be allowed to choose or adjust compliance periods. If businesses are able to choose their own compliance period end date, or modify the length of their compliance period, the AB32 market system will become increasingly confusing and opaque, potentially leading to criticisms about the program due to lack of transparency.

2. **Is there a need to establish an independent market oversight body?**

Environmental Defense Fund supports the use of market oversight body. In a market that creates a commodity out of a gaseous public good that cannot be held, measured, or seen, accounting integrity and trading oversight is paramount. The market oversight body can protect against allowance price volatility by providing high quality information about allowance and offset credits to market actors (so they can "police" each other). In the near term, since market

participants and investors must have reason to trust the commodity, emissions reporting verification and regulatory oversight must provide this assurance.

Emissions market oversight is important because it ensures consumer confidence and public health protection. However, excessive oversight adds unnecessary transaction costs will impede market efficiency, and should be minimized. Therefore, in determining the extent of oversight beyond informational services and community protection (from allowance trades that cause cumulative impacts in disadvantaged communities), CARB must weigh both the costs and benefits of the oversight it provides.

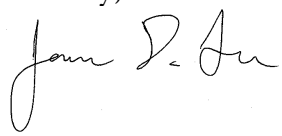
Environmental Defense Fund observes that if the cap-and-trade market is insufficiently robust, CARB may need to extend the role of oversight to a market maker, such as the Carbon Trust proposal of the ETAAC. The overseeing agency, be it a new Carbon Trust, CARB or another, might also host and manage the auctioning of emissions allowances, as well as the disbursement of auction allowance or other fee-based revenues.

3. **Which systems should be considered for linkage with a potential California cap-and-trade system?**

Another way to insulate AB32 allowance prices is to link to other GHG allowance markets that use economy-wide caps and reliable and consistent protocols for verifying allowances. Such expansion will insulate against regional shocks in allowance prices thru the geographic breadth of the marketplace. While linking offers stability and new opportunities for low-cost solutions, there will be transactions and enforcement costs that should be minimized by careful collaborative planning amongst market designers. Furthermore, due to de facto policy harmonization, the policies of any program to which AB32 is linked will be indirectly incorporated into the AB32 program.

In lieu of a national cap-and-trade, a regional program like the Western Climate Initiative offers many benefits for cost containment. However, since California has made a bold statement with AB32, regional or National collaboration should not be seen as a replacement of speedy, definitive and aggressive action by California to avoid the worst impacts and costs of climate change.

Sincerely,



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Appendix A
How Private Sector Financial Instruments Can Help Contain Costs of a Cap-and-Trade Program

By Nathaniel Koehane, Environmental Defense Fund

Under a cap-and-trade program for greenhouse gases, the key driver of investment and innovation will be the price of allowances set by the market. That price signal will drive the changes in production processes and consumer behavior needed to cut emissions; it will convey information about abatement opportunities throughout the economy; and it will help the market direct capital and other resources where they can be most productive. Like the Dow Jones stock market index, or the prices of commodities like wheat and fuel, the allowance price will go up and down in response to underlying changes in "market fundamentals." From the perspective of the economy as a whole, such price variation is an inevitable component of any healthy market.

At the same time, individual firms and businesses will also need assurance that they can manage and control their own compliance costs. For some, this will mean securing a fixed supply of allowances into the future, at a known price. For others, this will simply mean protecting themselves – or "hedging" – against the risk that the allowance price may rise or fall unexpectedly.

Congress can play a central role in providing cost-containment measures – for example, by allowing regulated entities to bank and borrow allowances, so that they can smooth their compliance costs over time. But the private sector – in particular, financial services firms – will also play a vital role, by offering a range of products to help firms contain cost by managing risk. This paper discusses that role, and explains how financial instruments might work in a carbon market.

An important theme runs through this whole discussion: It is not necessary to control the *price* of allowances (or any other commodity) in order to minimize the *cost impacts* that result from price movements. In other words, what matters for firms is that they can predict their own costs and plan for the future. Financial instruments allow them to do this in myriad ways – regardless of what happens to the market price.

Risk management and financial instruments: An introduction

Risk management is a critical business function in every industry. Risk-management strategies help companies prepare for the unexpected: new regulations, changes in the supply of raw materials and other inputs, spikes or drops in product demand, or any other event that affects the cost of doing business. Risk management, in other words, allows companies to plan ahead for bumps in the road.

Financial tools represent a critical element of the risk-management toolkit. This is particularly true for small companies that lack the resources and scale to handle risk through other means. According to the U.S. Energy Information Administration, small- and medium-sized firms are among those best served by financial instruments, because unlike larger firms they are less able to hedge their risk through measures such as vertical and horizontal integration, or the

maintenance of large inventories of physical assets.4 Organized exchanges that insure and settle trades, such as NYMEX and the Chicago Mercantile Exchange, provide a secure, transparent forum for such firms – and even private individuals – to manage risk.

The most common tools for managing risk are futures, forwards, options, and swaps. All are very common in emissions markets (both in the United States and in Europe), energy markets, and many other commodity markets (e.g., agricultural commodities, precious metals, and so on).

These instruments help manage risk by:

- diversifying that risk to an acceptable level;
- exchanging that risk with a party that may have a greater ability or willingness to absorb it; or
- swapping that risk with another party where such a swap is advantageous to both.

All of these financial instruments work because different firms vary in their ability and willingness to take on risk. An electric utility needs to ensure that it can operate at reasonable cost, regardless of the ups and downs of coal or gas prices (or the price of an allowance in the carbon market). It also has little ability to diversify across those risks over time or across space: A utility can't respond to an August heat wave by generating more power in October, and it can't suddenly replace a coal-fired boiler with a windmill. On the other hand, a financial services firm *does* have the ability to manage and diversify such risks – or else to find some other party willing to take it on.

This is the same principle that drives insurance markets. Any single or individual firm can be vulnerable to risk. Financial instruments act like insurance: they pool the risk among a number of firms, and in doing so cushion the shock to any one entity.

Derivatives: Futures, forwards, and options

Futures, forwards, and options are all known as "derivatives." In financial jargon, a "derivative" is just what it sounds like: a product that is *derived* from some underlying physical asset, but that can be traded independently of that asset. A contract to deliver a ton of wheat represents a physical commodity; an option to buy or sell that wheat at a fixed price, on some date in the future, represents a derivative. The key innovation embodied in a derivative is that once created it can be bought and sold independently of the original commodity. That makes it a very powerful tool for managing risk without requiring firms to hold physical inventory.

Derivatives enable companies to manage the costs of purchasing and consuming commodities *over time,* effectively damping the costs of unexpected price volatility due to unusual circumstances. In particular, futures, forwards, and options allow a company to lock in a *future supply* of allowances at a price that is known *today* – smoothing costs over time, and eliminating exposure to surprises in emissions markets. For example, a Midwestern electric utility might use these instruments to guarantee a supply of allowances at a known price, in order to insure itself against the possibility of a summer heat wave that would drive up demand for electricity and increase emissions.

[4] Energy Information Administration / Derivatives and Risk Management in Energy Industries

Futures and forwards

Futures and forwards are contracts to purchase something that will be created over time, i.e.,"in the future." The two terms refer to different trading settings: Futures are made on an exchange, such as NYMEX or the Chicago Mercantile, while forwards are a direct bilateral interaction between a buyer and a seller – known as an "over the counter" transaction. These trading settings translate into contrasting advantages. Futures are readily available at low transactions costs; they are also standardized and backed by the exchange. The chief advantage of forwards, on the other hand, is greater flexibility and thus scope for customization.

Futures contracts are revalued daily based on the prices of underlying commodities. (For example, gasoline futures are revalued based on the price of a barrel of oil.) The Chicago Climate Exchange has launched a separate futures exchange—the Chicago Climate Futures Exchange—to handle just this sort of transaction in both SO2 and greenhouse gas markets. (www.ccfe.com) The European Climate Exchange, for example, has already seen over 300 million CO2 futures contracts traded this year. Futures contracts are generally subject to a small fee, not unlike the charge a consumer might incur to purchase an extended warranty or pay an insurance premium.

Options

Options provide the buyer the right, or "option," to buy or sell something at an agreed-upon price. Unlike futures and forwards, options do *not* oblige the buyer to actually purchase the commodity; "options" contracts simply guarantee the option to buy or sell at a price agreed upon at the time the contract is written. In the SO2 market today, firms commonly purchase options on SO2 allowances for years in to the future. In doing so, they allow themselves the ability to "lock in" a price today—even if they opt never to act on this guaranteed price. This allows them to plan, financially, for the future and not leave budgeting decisions to the last moment.

Swaps

Swaps come in many shapes and sizes. Many swaps are just what they sound like: the swapping of either assets, such as cash flows, or liabilities, such as interest payments. Swaps minimize costs by obviating the actual exchange of physical assets: instead, the two parties to a swap simply assume each other's obligations. More broadly, the term "swap" refers to a contract in which money changes hands based on the value of an underlying asset but the asset itself is not exchanged. In this way, someone in Maine may enter into a contract with a party in Norway that guarantees both parties a constant price for a barrel of oil without ever having to exchange a barrel of oil. A small fee is often paid to a guarantor and all parties involved benefit from the new structure.

An extremely common type of swap involves interest rates; two parties paying off similar debt agree to "swap" or trade, their rate schedules and payments. The party paying a fixed rate agrees to take on the obligations of another party paying a variable rate, and vice versa, because the swap of payment schedules is advantageous to both parties. Interest rate swaps have been called

"one of the largest and, arguably, one of the most important and successful financial markets in the world.[5]"

In a carbon market, swaps could allow an emitter to lock in a fixed allowance price. Here's how it would work: A utility and its coal supplier agree on a fixed benchmark price – say $10 dollars per ton – for the carbon allowances needed to cover emissions from the fuel delivered under a contract. If the market price of an allowance falls below $10, say to $8/ton, the utility pays the coal producer the difference ($2 on each ton); if the market price rises above the $10 benchmark, the coal producer compensates the utility. Such a deal could benefit both parties. By guaranteeing a supply of allowances at $10/ton, it protects the utility against an unwanted rise in allowance prices. This gives the utility the assurance it needs to buy coal (rather than switching to another fuel or shifting more load onto another generator), which benefits the coal supplier. And notice that the "swap" keeps transactions costs low: all that changes hands is money (the difference between the market price and the contract price), rather than the actual allowances (which the utility would get by drawing down its own allotment, by bidding at auction, or by buying from another emitter).

Experience in current emissions markets

As already mentioned, these financial tools are already widely used in existing emissions markets to help manage risk. Both the Chicago Climate Futures Exchange (CCFE) and NYMEX now trade derivatives for conventional pollutants, and have seen rapid growth in market volume in the past year. Consider the following statistics from the first part of this year[6]:

- SO_2 futures trading on the CCFE hit nearly 1.9 million allowances in the first half of 2007, compared to about 500,000 during the first half of 2006, the first year CCFE offered emission derivatives trading. CCFE reports having traded 123,758 futures contracts during 2007, a 1,219 percent increase over the corresponding 2006 period. NYMEX reported that they cleared no contracts of this type in the first quarter of 2006, and 655 in the first quarter of 2007 alone.

- In the area of NOx futures, NYMEX cleared nearly 10,000 allowances this year, compared with a few hundred in 2006. CCFE did not offer NOx allowances last year, and cleared roughly 30,000 via futures contracts between February and June 2007.

- CCFE has moved 405,750 NOx allowances through options deals since April of 2007, when it first introduced this product.

- NYMEX indicated that they experienced nearly a 7 fold increase in SO2 trading in May of 2007 when compared to the whole of 2006. The CCFE has experienced similar growth.

Naturally, emissions markets are looking to bring the same tools to bear on the greenhouse gas market. In advance of a US carbon cap, some companies are already positioning themselves to use futures, forwards, and options to manage their carbon emissions in the long term. A recent press announcement by American Electric Power, for example, describes their "forward" plans

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[5] Weithers, "Credit Derivative: Macro-Risk Issues"
http://www.frbatlanta.org/news/CONFEREN/07FMC/07FMC_Weithers.pdf
[6] Platts: http://www.platts.com/Electric%20Power/Resources/News%20Features/emission/so2.xml

to purchase approximately 4.6 million tons of CO2e between 2010 and 2017, generated by capturing methane on livestock farms. This was done to "lock in" low-cost emission reductions today, and hedge against possibly higher emission reduction costs once the U.S. establishes a cap on greenhouse gases.[7]

The vast majority of European carbon emissions trading on the European Climate Exchange is trade in futures – in this case, contracts for allowances good only in the second phase of the European Trading System, which begins in 2008. Trading for phase II allowances even began before European leaders had decided the specific rules for the second phase. More recently, two companies, the European Energy Exchange and the financial derivatives exchange Eurex, have announced plans to enter the European emissions market by offering options and futures contracts for EU emission allowances.

Recent innovations: Derivatives based on events outside emissions markets

So far, we have focused on standard financial instruments that are fairly closely connected to the allowance market itself. But there is a wider array of innovative tools that have emerged in recent years, which could also help cushion the impacts of price uncertainty for firms of any size. Here we consider two examples: weather derivatives and catastrophe bonds.

A weather derivative is simply a contract whose payout is tied to the weather. For example, a firm might offer a weather derivative that pays $100 if the temperature in a particular state or region exceeds 90 degrees for 5 consecutive days. Such contracts provide a natural hedge against fickle weather, and for that reason are commonly used by a range of businesses whose revenues depend on the weather – for example, ski resorts seeking protection against a lack of snowfall, or electric utilities insuring themselves against an unexpected heat wave. According to Evolution Markets (a clearinghouse for information on emissions trading), a survey by Price Waterhouse Cooper found that the weather derivatives market has grown into a $4.2 billion market, trading approximately 4,000 contracts in 2001 alone.

Unlike the other financial tools we considered above, a weather derivative does not fix the price at which the utility could purchase allowances, or lock in a future supply. But it has much the same effect, since the payoff from a weather derivative could be used to buy the purchase of extra allowances. Indeed, Evolution Markets reports that weather derivatives are already used by electric power companies to manage the cost of emission allowances. And weather derivatives have the advantage of almost unlimited flexibility. For example, an electric utility could simultaneously invest in one contract that paid out when the weather was unseasonably warm, and in another that paid out when the temperature drops *below* a certain point. This type of "straddle" would protect the power company against both the possibility of increased emissions due to a heat wave and the possibility of decreased demand due to cold weather.

A catastrophe bond, commonly known as a "cat bond," allows a company to hedge against the risk of a natural disaster such as an earthquake or hurricane. For example, Nomura securities recently arranged a catastrophe bond for its client, East Japan Railway. The client will pay a premium on $260 million in bonds that will pay out in the event of an earthquake of a certain

[7] More details are available at (http://www.aep.com/newsroom/newsreleases/default.asp?dbcommand=displayrelease&ID=1375)

magnitude of the Southern Kanto region of Japan. Certain unpredictable natural disasters may have outsized influence on carbon emitters. A power producer that has a portfolio consisting of hydropower and coal-fired generation may need to significantly increase its coal power production in the event of a flood. This unforeseen increase in coal use will increase carbon emissions and costs in tandem. To manage this risk, the company could issue a catastrophe bond. Purchasers of this bond would receive a certain fixed rate on their investment (just as they would with any bond). In the event of a flood, however, the bond would be cancelled: the investors would lose their principal, which would be retained by the power company to help pay for the increase in CO2 costs due to the flood.

Like other financial instruments, innovative tools like weather derivatives and cat bonds reallocate and diversify risk away from the emitter. In the process, they provide a crucial function: the capacity to cushion the impacts of volatility and to make firm plans despite the inevitable uncertainty regarding what the future will bring. The safety net provided by all these tools will be a key feature of the carbon market, and a valuable complement to the policy mechanism enacted by Congress.

Conclusion

Congress will play an important role in providing cost containment measures, but the private sector will also play an important role by offering a variety of risk- and cost-management products. All of the measures discussed here help to limit a company's exposure to risk – and thereby yield a range of benefits. For example—

- They enable firms to plan for the future, knowing what their costs will be.
- They cushion individual firms from unexpected changes in markets.
- They allow firms to free up capital that would otherwise have to be held in reserve "for a rainy day," as a buffer against the ups and downs of the market.
- They free up capital by making loans cheaper. (This is because companies that use market mechanisms to hedge often borrow less and are viewed as a less risky investment because they have safeguarded their cash flows from volatility. And that means that banks make loans available to these companies at lower rates.)
- They also can free up capital by increasing the market value of the business that use these tools. In its review cited earlier, the EIA cites several studies showing that firms engaging in hedging increase their market value.[8]

How valuable will businesses consider these hedging instruments to be? The best proof of their value is their ubiquity – and that so many firms are willing to pay for them. A vigorous financial market gives businesses the freedom they need to find the solutions that best fit their needs – and provides financial service firms with the incentive to come up with those solutions at the lowest price.

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[8] Via EIA: G. Allayannis and J. Weston, "The Use of Foreign Currency Derivatives and Firm Market Value," *Review of Financial Studies*, Vol. 14 (2001), pp. 243-276. G.D. Haushalter, "Why Hedge? Some Evidence from Oil and Gas Producers," *Journal of Applied Corporate Finance*, Vol. 13, No. 4 (Winter 2001), p. 92. and Géczy, B.A. Minton, and C. Schrand, "Choices Among Alternative Risk Management Strategies: Evidence from the Natural Gas Industry," working paper (University of Pennsylvania, Wharton School of Economics, 2002).

In sum, financial tools such as these can help to contain costs and dampen the impacts of price variation in an emissions-constrained environment. Of course, derivatives and other financial instruments are not a panacea. They must be used with care, knowledge and consideration. Still, in a well-functioning, well-regulated and transparent market these tools will play an important role in risk management and cost containment that will help level the playing field for all players, contribute to the efficiency and effectiveness of the private sector, and spur innovation.