

**Le Centre français sur les Etats-Unis**  
***The French Center on the United States***  
**(CFE)**

Policy Brief No. 1

**The U.S. Climate Change Policy: A Preliminary Evaluation**  
by Laurent Viguier

March 2002

Ce texte prolonge la première réunion de travail du programme Energie et changement climatique du CFE, tenue le 15 janvier 2002 à l'ifri (Paris). Raymond Kopp (Resources for the Future, Washington) et Christopher Hessler (Environment Commission, U.S. Senate) participaient à cette réunion.

*This paper builds upon the first workshop of the Energy and Climate Change programme of the CFE, held on January 15, 2002 at ifri (Paris). Raymond Kopp (Resources for the Future, Washington) and Christopher Hessler (Environment Commission, U.S. Senate) participated in the workshop.*



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## The U.S. Climate Change Policy: A Preliminary Evaluation\*

by Laurent Viguier\*\*

President Bush has never made any secret that he doesn't like the Kyoto agreement, which seeks to curb greenhouse gas emissions in order to respond to the issue of global warming. The decision to reject the Kyoto Protocol was taken for three main reasons. The first argument is related to scientific uncertainty regarding global warming and how human action could impact it. Mr Bush considers that the Kyoto Protocol is "fatally flawed" because it is not consistent with the limits of our scientific knowledge. Secondly, Bush thinks that the Kyoto Protocol is unfair and ineffective because it excludes developing countries. He says that Kyoto Protocol's emission reduction requirements apply only to industrialized countries whereas global warming is "a challenge that requires a 100 percent effort; ours, and the rest of the world's." As far as the reduction of global greenhouse gases (GHG) emissions is concerned, large emitters, like China or India, should not be exempted from any participation. Finally, he thinks that the Kyoto targets are unrealistic, arbitrary and not based upon science. Mr Bush says the Kyoto Protocol, which commits 37 industrialized nations to cut gas emissions, sets unrealistic goals and could damage the U.S. economy, cost American jobs, and increase price for consumers. Of course we could add that most of U.S. senators have shared his view in the past. In 1997, the Senate has already voted not to ratify the treaty U.S. (the Byrd-Hagel Resolution (SRes 98) passed on July 25 by a margin of 95-0), and opposed any treaty that exempted developing countries and would inflict economic harm on the United States. That vote killed the ratification process anyway.

Since the withdrawal from international negotiations, the Bush Administration is seeking an alternative strategy to the rejected Kyoto Protocol to reduce greenhouse gases. The Bush administration was expected to bring a "constructive position" to the ongoing Kyoto Protocol negotiations in Bonn in July 2001. But nothing happened. According to the *Wall Street Journal*, an alternative approach to the Kyoto Protocol was supposed to be presented to UN climate negotiators at their November meeting in Marrakech (August 20, 2001). Again, nothing came up. In December 14, 2001, the *Financial Times* reported that the Bush administration was closed to formulating an alternative plan to the Kyoto Protocol. Finally, after months of internal debate, the

\* This paper has been written for the French Center on the United States (CFE, ifri). Research has been supported by the Swiss NCCR Climate grant. I wish to thank Denny Ellerman, Alain Haurie, Pierre Lepetit, Pierre Noël, John Reilly and an anonymous reviewer for helpful comments and suggestions. Any views or opinions presented are solely those of author and do not necessarily represent the opinions of CFE, ifri.

\*\* Laurent Viguier contributes to the Energy and Climate Change Program of the French Center on the United States (CFE, ifri). He is a Research Fellow at the University of Geneva (HEC), Geneva. E-mail: [Laurent.viguier@hec.unige.ch](mailto:Laurent.viguier@hec.unige.ch)

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Bush administration has outlined a climate policy released by the White House Council of Economic Advisers and reported in the 2002 Economic Report of the President (2002). In contrast to the hard target and short timetable approach adopted in the Kyoto Protocol, the administration policy opts for a gradual-flexible approach requiring “reasonable goals” consistent with existing climate science without putting the economy at risk.

In the Report, “gradual” means that GHG emissions growth should be reduced before trying to stop and eventually reverse it. According to the authors, gradualism is supported by the need to adjust as we learn more from the science and are able to take advantage of technologies as they develop, to balance the need for mitigation with the need for economic growth to power future innovation, and to give technology and institutions time. “Flexibility” doesn’t mean that the U.S. climate policy should be based on the “flexibility mechanisms” considered in the Kyoto Protocol. International emission trading is regarded as a useful theoretical benchmark that will need a lot of time to be implemented considering institutional and logistical obstacles. The report stresses that targets should be flexible in the face of economic growth, encouraging reductions without threatening the economy. Two possible options for a near-term goal are put forward to do the splits. One is to index GHG emission target to economic output. Another solution is to express the goal in terms of GHG emission intensity.

Following the Report approach, President Bush has presented a voluntary plan to slow the growth of U.S. GHG emissions on February 14. The main goal is to reduce greenhouse gas intensity by 18 percent over the next 10 years. According to a fact sheet available in the White House web site<sup>1</sup>, the GHG intensity would decrease from 183 metric tons (Mt) per million dollars of GDP in 2002 to 151 Mt per million dollars of GDP in 2012. The implementation of new policies and programs consistent with this goal are expected to avoid more than 500 Mt of GHG over the next decade.

This new method – that would adjust GHG emission path with economic growth, according to scientific knowledge, to time needed for capital replacement, technological progress and institutional change – may be a promising one, but are the means equal to the task? Is the strategy really “aggressive” or is the intensity target reachable along the business-as-usual scenario?

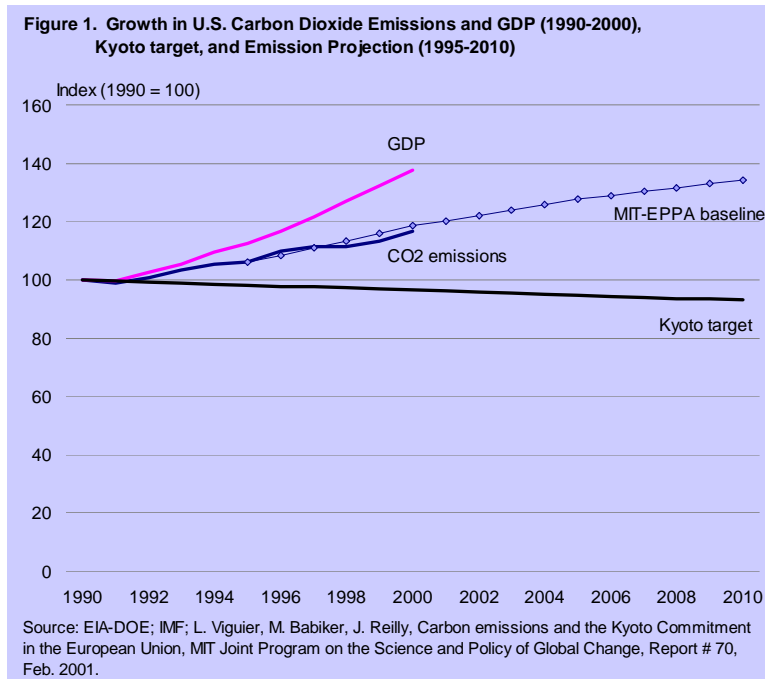
## **1. Economic and Political Obstacles**

The current emission path is not really consistent with a deep commitment in the short run. On average, the annual growth rate in energy-related CO<sub>2</sub> emissions has been reduced to 1% between 1996 and 1999 despite rapid economic growth (see Figure 1). Based on this trend, some analysts have argued that U.S. economy had been decoupled from energy use and resultant emissions (see Gruenspecht, 2001). However, the U.S. Department of Energy estimates that U.S. carbon emissions were 1,583 MtC in 2000.

<sup>1</sup>. At the following address: <http://www.whitehouse.gov/news/releases/2002/02/20020214.html>.

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That represents a 17% increase from 1990, and a 3% increase from the previous year 1999 that reflects increased use of natural gas and coal for power generation.

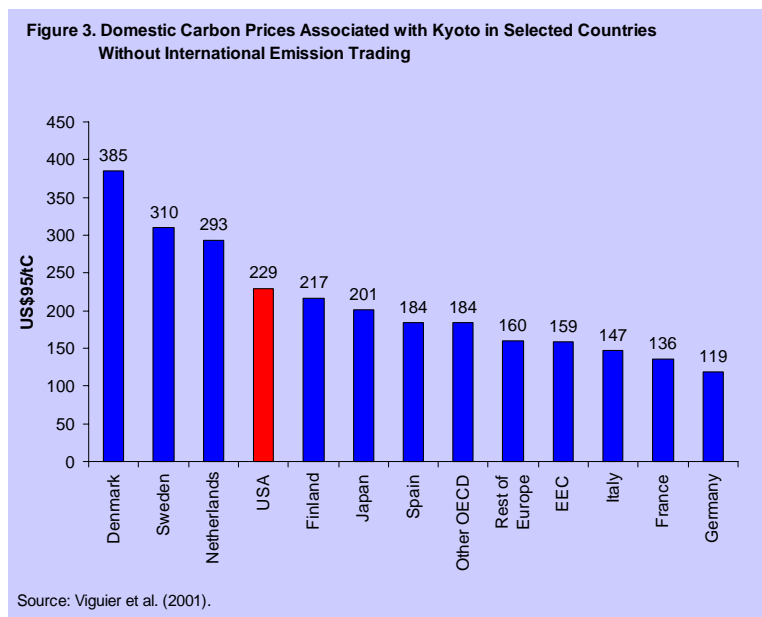
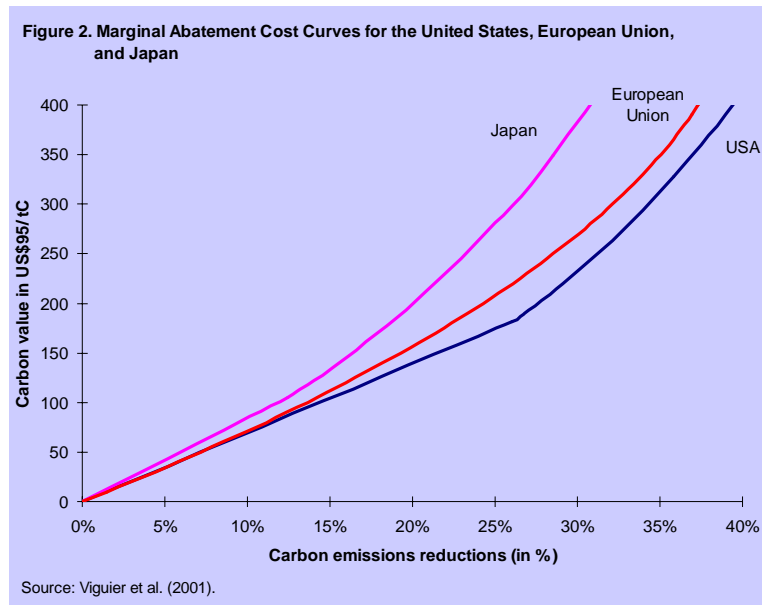


According to R. Kopp (2002), in 2001, a year in which the US economy was in recession, carbon emissions are not expected to decline, but rather to be relatively flat. These figures challenge the “decoupling” argument and low emission growth rates were largely due to weather patterns and other *ad hoc* factors.

According to the MIT-EPPA model, U.S. emissions are projected to increase by 463 MtC from 1990 to 2010 in the business-as-usual scenario (see Figure 1). This result is consistent with the business-as-usual projection by the U.S. Energy Information Administration suggesting that carbon emissions will rise by more than 30 percent above 1990 levels by 2010. That means that the United States would have had to reduce their carbon emissions by around 558 MtC from the reference 2010 projection to meet their Kyoto target. In the mean time, European countries would have, on average, to reduce their emissions by 20% from the 2010 baseline to respect their Kyoto commitment.

These expectation about baseline emission growth explain why the Kyoto target is considered as unrealistic by the Bush administration. One need to understand that the domestic “carbon price” or the “shadow price” associated with a carbon constraint depends on the reduction required from reference emissions and on mitigation opportunities. As shown in Figure 2, the shape of the U.S. carbon abatement cost curve

– which depends on substitution possibilities within the economy – is lower than the EU and Japanese curves. It means that U.S. economy has potentially more opportunities to reduce emissions at a given carbon price than the other Annex B countries. However, the emissions target is more difficult to reach. As a result, the carbon price of Kyoto is expected to be \$229 per ton of carbon for the U.S., a relatively high level compared to large EU countries and Japan (Figure 3).

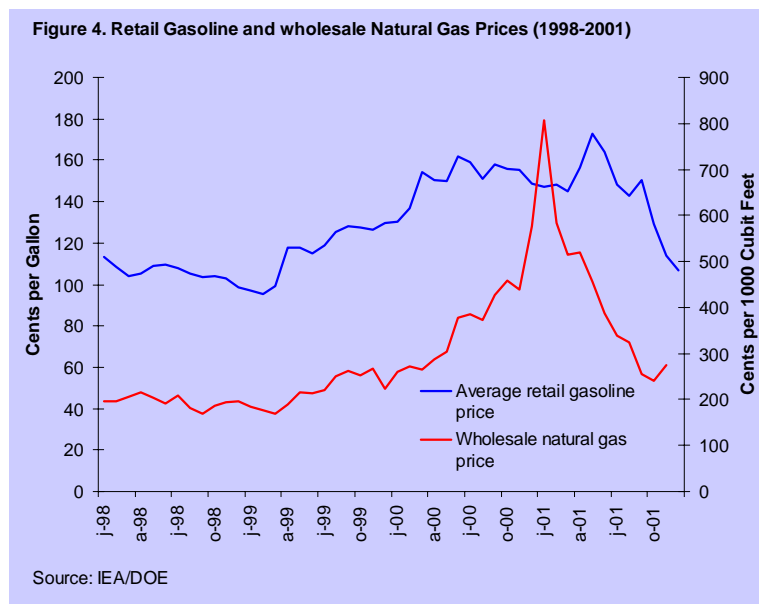


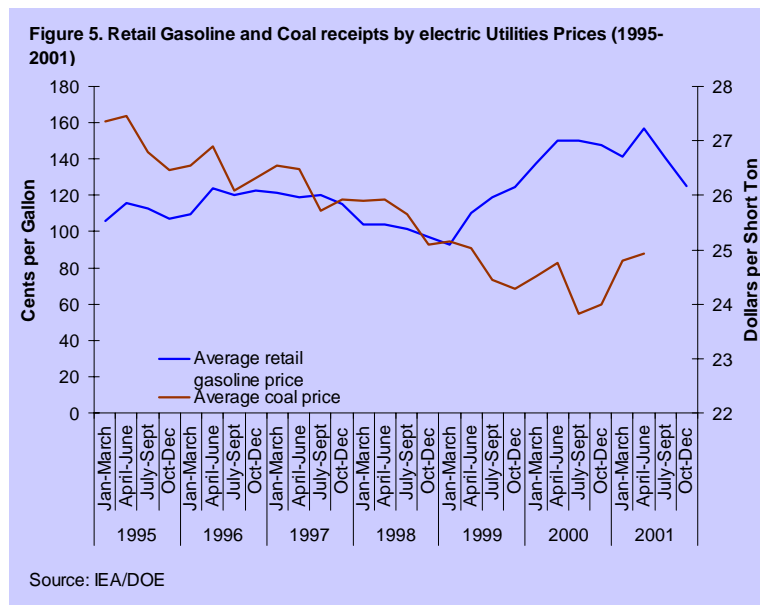
The resulting increase in energy prices would be a nontrivial change in the American mindset expecting that energy will always be inexpensive (Kopp, 2002). The U.S. greenhouse gases emissions growth results mainly from low energy prices and from unfavourable relative prices of fuels. After the recent spike in gasoline prices nationwide, average retail prices of gasoline and gas prices have declined at the end of 2001 to attain their pre-2000 levels (see Figure 4). The national average retail prices of

gasoline have turned down rapidly and were only \$1.07 per U.S. gallon in December 2001. In October 2001, natural gas wellhead prices have returned to their 1999 level at \$2.40 per million BTU. In the meantime, coal prices were gradually falling. The average prices of coal receipt by electric utilities were closed to \$25 per short ton from January to June 2001 (see Figure 5). That corresponds to a 9% reduction from January 1995.

According to the U.S. Energy Information Administration (EIA), with the exception of the Midwest, average gasoline prices have fallen about 39 cents per gallon from their peak in mid-May through October 29, 2001. A 21 cents reduction is accounted for the declining crude oil prices, up to 10 cents more by seasonal factors, and the remaining 8 cents reflects other influence as a weaker economy and both supply and demand impacts of the terrorist attacks. Taking into account the recent continuing declines in spot market prices, along with the typical lag relationship between spot and retail prices, the EIA predicts further moderate declines of gasoline prices.

As shown in Figure 5, coal prices have tend to decline relative to gasoline prices. Low relative prices for coal will continue to stimulate increased utilization of coal-fired power plants whereas the use of coal and natural gas for power generation was a significant factor in 2000 emission growth. The existing fleet of coal-fired power plants are likely to be economical to operate for many years into the future, even if pre-2000 natural gas-price projections are realized (Joskow, 2001). Especially since President Bush's long-range energy plan includes the use of more coal-burning plants and promote low energy prices. Promoting his energy plan, President Bush said recently that “Jobs depend on affordable energy. If there's (an energy) price spike or a disruption in supply, people may not have work” (Reuters, January 23, 2002).





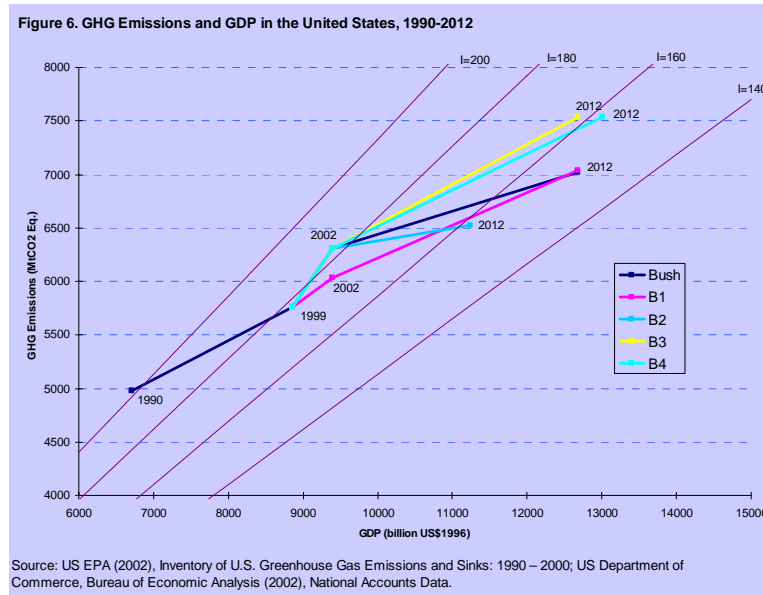
Low fossil energy prices, relative to the European Union, imply that achieving Kyoto-like targets within Kyoto timetables would require an extraordinary amount of effort and political will (Kopp, 2002). Are Americans ready for that effort? According to a March 2001 Time-CNN poll, two-thirds of Americans say President Bush should develop a plan to reduce the emission of greenhouse gases. More than 40% said they consider global warming a “very serious” and 30% said it was “fairly serious”. However, People were evenly split on whether they would be willing to pay 25 cents more per gallon for gasoline to reduce pollution and global warming. Moreover, 60% were willing to pay that much more in November 1997 according to a Princeton Survey Research Associates / Pew Research Center poll.

U.S. expectation regarding energy prices are a major obstacle to an effective climate policy. 25 cents more per gallon is equivalent to around \$30/tCO<sub>2</sub> or \$110/tC. This is very far from what one might expect to meet a Kyoto-type target. Indeed, if the Kyoto target were to be implemented by an effective domestic policy without international emission trading, the carbon price would be \$229 per ton of carbon. That corresponds to a 54 cents increase per gallon or 14 cents per liter!

## 2. “Aggressive” Strategy or “Hot Air”?

Is the Bush plan only “smoke and mirror”? Difficult to say. It will partly depend on GHG intensity in 2002 and baseline GDP growth over the next decade. According to the U.S. Environmental protection Agency, GHG intensity has declined from 202 metric tons per million dollars of GDP in 1990 to 177 in 1999 (see Figure 6). That represents a 1.46% reduction per year over the past decade. Taking into account past trends, economic and climatic context, U.S. intensity will probably be around 175 in 2002. The assumed 183 metric tons per million dollars of GDP in 2002 is thus controversial. It means that the U.S. economy may return to its 1998 level in 2002. By

assuming a high intensity rate in 2002, the Bush administration is creating a sort of “hot air”. Intensity improvement and the resulting avoided emissions through policies and measures might be overestimated.



As shown in Figure 6, if we assume that GHG intensity will be 183 in 2002 and will continue to decrease by 1.46% per year over the next 10 years, the intensity might be around 158 in 2012, a level closed to the Bush target (see Bush case). If we suppose that the intensity is not 183 but 175 in 2002, it would be around 151 in 2012 if we apply the BaU intensity reduction rate (B1 case). Thus, the Bush plan could be easily reached, under realistic hypothesis, without any specific climate change policy.

How would emissions evolve if the target were met? The answer will largely depend on baseline GDP growth. Let’s assume that the U.S. intensity will be 183 in 2002, as believed by President Bush, and will decline on average by 1.46% per year by 2012. Assuming that GDP will be around 9400 billion 1996 dollars in 2002, slightly higher than 2001 and 6% above 1999, and that economic growth will be the over the next decade as it has been during the decade 1990-2000 (+3% per year), GHG emissions might increase by 714 million tons of CO<sub>2</sub> equivalent (see Figure 6). Now, if we suppose, everything been equal, that the annual average GDP growth rate will be 1.8% during the next decade (B2 case) – a growth rate corresponding to the slow decade 1973-1983 – GHG emissions increase by 215 MtCO<sub>2</sub>-eq. between 2002 and 2012, or +31% between 1990 and 2012. It is fair to say that U.S. GHG emissions will continue to grow, even if the Bush plan is implemented.

Where does the 500 million tons avoided come from? This reduction could be achieved if we take optimistic assumptions. For example, if the intensity rate is 183 in 2002 and if the baseline GDP growth rate is closed to 3.3% per year (B3 case). It is also accessible if the intensity rate is 183 in 2002 and if the baseline intensity decrease by 1.2% per year over the decade 2002-2012 (B4 case). However, if the intensity rate is not

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183 but 175 in 2002, it becomes difficult to expect 500MtCO<sub>2</sub>-eq. Indeed, one would assume a GDP growth rate closed to 4% per year or a flat intensity rate in the baseline scenario.

### **3. Gradualism versus Shock Therapy?**

Considering the U.S. economic and political context, one might not expect more than a moderate gradual approach aiming at slowing emissions growth in the first round. Unlike the “deep, then broad” approach of Kyoto, the Economic Report of the President confirms the U.S. preference for a “broad, then deep” approach advocated by many experts (Schmalensee, 1996; Hahn, 1998; Shogren, 1999). According to Schmalensee, the policy architecture implicit in this alternative approach “would place less stress on near-term emissions reductions, which are of relatively little importance over the long haul, and would concentrate instead on developing institutions to ensure broad international participation in emissions abatement, which is essential to any serious effort. “Deepening” would involve later tightening constraints on global emissions and, perhaps, developing the institutions necessary to give teeth to “legally binding” emissions constraints, when and if participating nations make a collective decision to do this”. Basically, supporters of the “broad, then deep” approach think it is necessary to begin slow in order to maximize participation at acceptable costs. Time is necessary to adapt gradually the energy capital stock, develop low cost and low carbon technology substitutes, create incentives, design institutional frameworks and experiment market mechanisms on a small scale.

One of the main disadvantages of the Kyoto’s targets-and-timetables approach is that the government authorities responsible for meeting the quantity targets are supposed to have the necessary information on future emissions and abatement costs to find the appropriate level of emission reduction. It is obvious that some countries – including the United States – have accepted unrealistic targets at Kyoto. To mitigate adverse consequences of the quantity approach, the Kyoto Protocol allows Annex B Parties to trade emission permits. Is that enough? The present debate between RFF and MIT experts, mentioned in *The Economist* (February 14, 2002), shows that this is an open question. To deal with uncertainty on costs, researchers at RFF recommend a “hybrid” instrument combining a cap-and-trade system with a “safety valve” (Kopp *et al.*, 1999) whereas MIT researchers suggest to avoid complete inflexibility by the phasing in of quantity targets, coupled with provision for banking and borrowing (Jacoby and Ellerman, 2002). The performance-based approach is another way to cope with uncertainty. However, flexibility will ultimately depend on the domestic climate policy architecture, and particularly the use of economic mechanisms, such as carbon tax or tradable permits, which are considered to be more flexible than traditional command and control instruments (Bohm and Russell, 1985).

Will the performance-based approach be easier to implement than the quantity approach of Kyoto? Not so sure. It will hardly depend on how the aggregate performance goal is translated into concrete policies and converted into sectoral and individual targets. Might the U.S. decide to implement a domestic emission trading

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system, the performance approach will probably create extra institutional and design troubles. The Report is probably right in drawing attention on the institutional and logistical obstacles to implementing an international emission trading regime for greenhouse gases. However, one needs to balance the institutional complexity of creating a wide tradable permits regime at the first attempt with the difficulty to interlink existing non-harmonized domestic systems, and broaden narrow tradable permits regimes that tend to be resistant to policy change of any sort (Schmalensee, 1996). By designing a EU-wide emission trading system to be started in 2005, the European Commission is showing that it might possible to take the plunge.

Finally, is it really a controversy between gradualism and shock therapy? In theory yes, but in practice the U.S. withdrawal and the Marrakech agreement change dramatically the character of the Kyoto Protocol. Using the MIT-EPPA model, Babiker *et al.* (2002) estimate that Annex B GHG emissions may increase by around 9% under Marrakech and that the international carbon price might fall below \$5 per ton of carbon if all Russian and Ukrainian hot air were freely traded, and if Annex B countries made full use of the additional Article 3.4 sinks. On one side, the Kyoto commitment without the U.S. is thus expected to be barely constraining and to have a poor environmental efficiency. On the other side, the U.S. method is promising but the Bush voluntary target is very modest.

Since everybody is starting slowly, it is urgent to address the challenging question of future commitment and developing countries' participation. The U.S. approach could be a good candidate for a worldwide differentiation of GHG emission reductions. Rather than negotiating binding emission targets, it might consist in agreeing on flexible rules to reducing emission intensities.

## References

- Babiker M. H., Viguiet L. L., Ellerman A. D., Reilly J. M., and Criqui P. (2001). Welfare impacts of hybrid climate policies in the European Union. Report #74, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA, accessed via [http://web.mit.edu/globalchange/www/MITJPSPGC\\_Rpt74.pdf](http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt74.pdf)
- Babiker M. H., Jacoby H. D., Reilly J. M., Reiner D. M. (2002). The Evolution of a Climate Regime: Kyoto to Marrakech, Report #82, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA., accessed via [http://web.mit.edu/globalchange/www/MITJPSPGC\\_Rpt82.pdf](http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt82.pdf)
- Bohm P., Russell C. (1985). Comparative Analysis of Alternative Policy Instruments, in *Handbook of Natural Resources and Energy Economics*, Vol I, pp 395-460, eds. A.V. Kneese and J.L. Sweeney, North Holland, Amsterdam.
- Gruenspecht H. (2001). U.S. Energy-related Greenhouse Gas Emissions: Rapid growth during 2000, RFF, accessed via <http://204.176.103.53/features/feature123.htm>
- Hahn R. W. (1998). *The Economics and Politics of Climate Change*, Washington, D.C.: The American Enterprise Institute Press.
- Jacoby H., Ellerman D. (2002). The "Safety Valve" and Climate Policy, Report #83, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA., accessed via [http://web.mit.edu/globalchange/www/MITJPSPGC\\_Rpt83.pdf](http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt83.pdf)

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- Joskow P. (2001). U.S. Energy Policy During the 1990s, MIT Center for Energy and Environmental Policy Research, Working paper #4, July 11, accessed via <http://web.mit.edu/ceepr/www/2001-004.pdf>
- Kopp R., Morgenstern R., Pizer W., Toman M. (1999). A Proposal for Credible Early Action in U.S. Climate Policy, Resources For the Future, Washington D.C., accessed via <http://www.weathervane.rff.org/features/feature060.html>
- Kopp, R. (2002). The Evolution of United States Domestic Climate Policy: A status Report, presented at the Workshop on « Changements Climatiques: Après Marrakech, quelle politique pour les Etats-Unis ? », Centre Français sur les Etats Unis, January, 15.
- Shogren, J. (1999). The Benefits and Costs of the Kyoto Protocol, Washington, D.C.: The American Enterprise Press.
- Schmalensee R. (1996). Greenhouse Policy Architectures and Institutions, Report #13, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA., accessed via [http://web.mit.edu/globalchange/www/MITJPSPGC\\_Rpt13.pdf](http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt13.pdf)
- Viguié L. L., Babiker M. H., Reilly J. M. (2000). Carbon Emissions and The Kyoto Commitment in the European Union, Report #70, MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA., accessed via [http://web.mit.edu/globalchange/www/MITJPSPGC\\_Rpt70.pdf](http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt70.pdf)

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- Policy Brief No. 1. Laurent Viguiier, “The U.S. Climate Change Policy: A Preliminary Evaluation”, March 2002.