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## Viewpoint

## A new strategic plan for a carbon tax

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### HIGHLIGHTS

- International Green House Gas negotiations have foundered on the need to allocate caps.
- A small carbon tax is a more achievable policy than the global cooperation needed for caps.
- A small carbon tax among cooperating nations can fund much more energy research and development.
- Access to advanced technology creates a relatively low cost incentive to cooperate.
- Lower cost energy services, if achieved, would improve human welfare

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### ABSTRACT

This paper proposes a new Green House Gas policy building upon general consensus in scientific, political and economic communities including:

1. Concern too little progress is being made toward an integrated global approach to controlling CO<sub>2</sub> emissions.
2. Recommendation of a carbon tax.
3. Need for increased R&D for alternative energy sources.
4. Substantially increased research and development expenditures are relatively inexpensive.

Here, these elements are woven into a coherent strategy that should be far more politically acceptable by global governments than current alternatives. Here are its elements:

1. A small carbon tax whose proceeds are tied exclusively to energy research and development in a dedicated trust fund.
2. Deployment of the fund to demonstrate benefits of the approach and its incentives for other countries to join.
3. The establishment of a commonality of interest among participating nations.
4. Clear incentives for additional nations to participate.

The ultimate goal, energy services at lower cost than today with fossil fuels, is appropriately ambitious. The proposed approach is functional, timely and will produce benefits going well beyond simply stemming global warming. It would also tend to obviate the need for implementation policy: economic choice would lead to transition to such new technologies.

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## 1. Introduction

### 1.1. A climate change policy

Current circumstances of climate science may permit a reconsideration of direction for existing policy efforts related to global warming issues. This paper presents a plan that provides an achievable path toward a global policy on Green House Gas (GHG) emissions. At

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the heart of it is a small carbon tax (actually a GHG tax). The proceeds of that tax are to be used strategically to provide stable, long term support of a broad based research and development effort focused on energy sources, energy use, and emission mitigation.

Over the last 15 years, [Intergovernmental Panel on Climate Change \(IPCC\)](#) sanctioned global warming predictions have significantly overestimated global warming. Those predictions supported much of the effort of the last 20 years to effect a global policy regarding warming. A slower warming rate suggests that the problem is less urgent and allows more time to develop mitigation strategies and explore new approaches. This circumstance seems to be settling into the informed public arena, that is, those who distinguish between science and public policy. The point is that recent warming trend “is not a crisis for climate science. This is just the way science goes ([Houston, 2013](#)).”

Although not as dire as predicted, underlying climate fundamentals indicate some action could be needed. It should be pointed out, though, that dire warnings have not ceased. As of this writing, in March, 2014, the IPCC just released a new report asserting that “climate change could drive turbulence and conflict, prompted by migration from newly uninhabitable areas and jockeying for water and food.” According to the Christian Science Monitor, IPCC chairman Ramesh Pachauri said: “We have assessed impacts as they are happening on natural and human systems on all continents. In view of these impacts, and those that we have projected for the future, nobody on this planet is going to be untouched by the impacts of climate change.” ([Spotts, 2014](#)) Dire, indeed.

Throughout this paper I will try to be neutral as to how urgent a global warming problem is. The scenarios, after all, do differ and although they are outside the scope of this paper, it is reasonable to conclude there is at least ample evidence for real concern. Extremely credible people are on both sides of the issue and a prudent course in the face of this uncertainty is to take some action. Moreover, the fact that carbon dioxide is a GHG is indisputable.

## 2. Methods

### 2.1. Analysis of existing cap and trade shortcomings

Proponents of achieving large reductions in emissions in the near term have embraced global cap and trade approaches. “Cap and trade” refers to an environmental policy tool whereby “caps” or limits are set on the amount of a pollutant that can be emitted. The limit is usually set by governments or some other central authority. Organizations that emit the specific pollutant are then granted or sold permits which allow them to discharge pollutants in the amount of their permit. Firms that have reduced emissions below their “cap” are permitted to “trade” or sell permits to other firms. The level of emissions dictated by the cap is almost always lower than existing emissions and is reduced over time.

The European effort and the European Union Emission Trading Scheme cap and trade system have virtually collapsed. Similarly, the international treaty negotiations, last occurring in Copenhagen, are making little progress. The global consensus, critical to such a treaty, failed as the developing world argued that they would not sacrifice economic growth for environmental policy.

The international meetings, first at Rio and then Kyoto, set ambitious goals for carbon reduction and sought to allocate “allowed emissions” by country or group. This was an extremely difficult policy to pursue and, as many predicted, has basically proven to be a failure.

The dynamic of the failure was quite simple. Allocating emissions amounts to a division of a pot of value. Every participating entity has a strong incentive to make a case for more than a proportionate share of the allocation. Thus, the demands for allocations stand in the way of moving forward ([Helm, 2012](#)).

One compromise is to simply over allocate, as has occurred in the European Union which did institute a cap and trade system. Consequently, traded allowances have fallen to near zero prices and carbon emissions have increased. Even this softened approach is not close to being adopted by the US and China, the world's two largest emitters.

Cap and trade has arguably been successful in the US with regard to sulfur oxide (SOX) and nitrogen oxide (NOX) emissions. Prices for those allowances have also fallen dramatically, but only after years of emissions reductions.

However, the situation there is quite different than that confronting any global warming policy. The US federal government, through the EPA, provides an overriding authority that can establish binding caps by force of law, and can govern to ensure the integrity of the trading. No such authority exists at an international level, and achieving such is a far bridge.

## 3. Results

### 3.1. A new approach

In the face of these disappointments, a new approach is necessary. The approach I describe is incremental, transparent and offers readily apparent incentives for global participation. Moreover, the timing for a new policy approach may be right. Although urgent global warming initiatives are viewed with skepticism, a middle path that avoids the economic risk of cap and trade systems while putting into place serious research and development initiatives, demonstrates clear benefits and, importantly, creates a structure that can evolve may be acceptable to skeptical, but uneasy, political leaders and their supporters.

Even a small tax among a few Organization for Economic Cooperation and Development (OECD) nations would provide ample funds to provide stable financing of research and development into non carbon energy alternatives.

The best, albeit extremely difficult solution to atmospheric carbon problems which are not just limited to warming, is to find and develop less expensive non carbon energy sources to underlie our modern economies, use less energy to provide our services, and find ways to prevent or recover GHG's from the air.

Heretofore, such programs and the levels of their funding have been impacted by political winds. A dedicated effort with secure funding and scientifically administered is the most efficacious approach to achieving the goal of science based research and development to create better energy alternatives.

In its 2012 Global Energy Assessment Report, The International Institute for Applied System Analysis calls for a much more internationally coordinated and planned effort for governing research and development, which it terms the “Energy Technology Innovation System ([Grubler et al., 2012](#)).” A source of dedicated funding from an expanding group of cooperating nations would grow and would help foment such an effort. Note also that an initial modest tax implies that the funding could also grow by increasing the tax only slightly.

This approach I suggest has the benefit of putting in place a policy framework that would allow more stringent action if and when the case for damages from warming becomes stronger (as many climate scientists view as a certainty).

## 4. Discussion

### 4.1. Carbon tax fundamentals

The economist's logic for a carbon tax (or any externalities tax) starts with the premise that increasing carbon dioxide concentration

in the atmosphere causes warming; the physics of this are fairly (though not entirely) incontrovertible. Continued warming will risk substantial harm to ecosystems and the world economy. Carbon concentration increases may have other adverse impacts on ocean pH (acidity) and other effects.

A carbon tax can theoretically create a net gain to world society over the long term as it provides an incentive to reduce emissions directly and encourages the search for alternatives to carbon energy (Helm, 2012). These actions impose a cost to the economy, but that cost is more than offset by reduced harm based on wise policy.

There is also the matter of revenues collected by governments through the tax. George Schultz and Gary Becker recently offered support to a long standing proposal for “revenue neutrality” that involves returning the funds to taxpayers (by a formula unrelated to their use of carbon fuels) (Schultz and Becker, 2013). This is offered as a means of making a carbon tax more palatable to citizens.

In considering these and like proposals, one should clearly understand that despite such a return of funds, today’s consumers are not better off. The higher costs they will bear for energy directly, and the products that require energy to be produced (virtually everything), is greater than the rebate they will receive in total, though there might be some short term gainers. The benefits that more than offset the cost of carbon reduction will accrue to future generations who will be spared some global warming harm and who will be the beneficiaries of new energy technologies.

In any case, for a carbon tax to make sense, those likely benefits must exceed probable costs. This cost benefit analysis goes to the heart of the debate over estimates of harm from warming and the timing of that harm. The further in the future we might expect harm, the less those damages should be weighed in current policy. That is one big reason why the recent flattening of future global temperature estimates matter. The case for urgent climate change action depends not on current temperature levels but rather that temperature and other impacts that are expected for the future.

#### 4.2. A coherent strategy is needed

Creating an effective, and by necessity, multinational approach to the global warming problem, must first be viewed for what it is: a monumental task in scope and size. Such a collaborative effort is unprecedented. It ultimately demands participation by every significant economic player in a game that will be costly. This perspective is appropriately daunting, and, as has been shown, the approach is so daunting that to date no unified global approach has been successful.

Thus, a better strategy may be to begin with small simple steps with as much clarity as possible.

Implementing a small carbon tax (\$2/ton, arbitrarily) would be relatively simple. Inventories of greenhouse gases already exist. A small tax has very limited economic consequences to hinder its adoption.

Some will argue that it is a “camel’s nose under the tent.” But that is exactly the point: we are far from sure we will not need the camel in the tent even if unpleasant. Moreover, the twin objective is to develop alternative energy sources, an objective that is endorsed by both global “warmers” and “deniers.” In terms of benefit cost fundamentals, the costs imposed by the tax are, in a probabilistic sense, outweighed by even a very small chance of dire warming consequences being realized and we would gain valuable experience by implementing the program.

There are a number of significant greenhouse gases in addition to CO<sub>2</sub>. The tax should equivalently apply to all to the extent administratively possible. The \$2 is entirely hypothetical. The

actual level should be set with some notion of the level of funding for indicated research that might be sensible.

Of course, such a small tax would provide little incentive to reduce carbon emissions (Nordhaus, 2008). The key gain is in the strategic use of the proceeds of the tax. In terms of the US dollars spent on energy, it is tiny, but applied to energy research and development and warming research expenditure, it is huge. The US Environmental Protection Agency (EPA) estimates 5376.9 metric tons of GHG emissions for 2012 in CO<sub>2</sub> equivalents. Converting to US tons, this is 5927.0 t. At \$2 per ton this yields \$12 billion (Environmental Protection Agency, 2014). This compares to current estimated global expenditures on research, development and deployment of U.S. \$50 billion (Grubler et al., 2012).

The Global Energy Assessment, in fact, makes the point that current research and development may be underfunded. “According to one analysis of the US private sector using data from the National Science Foundation’s annual survey of companies, private sector economically targeted investments (ETI) fell approximately 20% during 1994–2004. The US electricity sector’s R&D arm, the Electric Power Research Institute (EPRI), saw its budget decline by a factor of three during that time period (Nemet and Kammen, 2007). Also, companies are far more likely to invest in short-term R&D projects that are likely to bear fruit in the near term than to invest in longer term, more fundamental R&D (Grubler et al., 2012).”

Important as well, if these revenues were dedicated to a “trust fund” separately administered for this purpose, it would create a stable source of funding for this activity (Helm, 2012). As I noted earlier, energy R&D has been notable for rising and falling with political winds and the political popularity of specific projects.

The tax revenues and trust fund should be thought of as incremental to existing efforts and expenditure. Unwinding existing “entitlements” (to be perhaps unduly pejorative) would place a dysfunctional obstacle in the way of adopting the program. Incorporating existing programs whole hog would likely politicize the trust fund at its inception. Ultimately, efforts could be harmonized by raising the tax slightly and permitting those involved with existing efforts to submit follow on proposals to the trust fund governance.

Just a few countries agreeing to impose such a tax would effectively get things started. The proper goal of such energy R&D is to find alternative means of providing energy services at lower cost than today without potential global warming impacts. Also, note that this specific goal should be politically palatable even to the most fervent “deniers.” That is, energy services at a lower cost is a goal that is acceptable, even desirable, across all political spectrums.

A tax coalition of a few countries, or even one, could, with ample funds, pursue that goal with much greater alacrity than has ever been done before.

Energy has been called the “master resource” because it is so critical to our modern economies and their continued growth. As and if the cooperating countries’ R&D efforts begin to achieve the energy cost goals, they can potentially reap huge benefits. Sharing those benefits should be a condition of tax coalition participation.

Such benefits create an incentive for more nations to join in. Further, to the extent the coalition becomes larger, the scope of research can become broader and deeper. The analogy here is to inventors and entrepreneurs capturing the benefits of their innovations. Coalition nations should so benefit.

The incentives built into this proposal stand in stark contrast to the policies that have been pursued and have failed, notably cap and trade. This, as much as anything, supports the notion of a new policy path, one that recognizes the need for across the board benefits for all participating nations.

As I have suggested, the incentives for agglomeration of nations with a hypothetical cap and trade regime are inherently perverse.

Should a few countries agree to cap and trade, convinced of the dangers of global warming, they will, if their policies are effective, delay the consequences of warming, reducing the incentive for other nations to join them. Further, there will be the constant battle over harmonizing the allocations of allowed emissions among nations. Tax harmonization is simple and straightforward and logical. A ton of CO<sub>2</sub> causes the same effect whether from the US, China, India, or Nigeria, and if it becomes clear such emissions do entail dire threats, everyone should have the same incentive to avoid them.

#### 4.3. *If the science becomes overwhelming*

One push back I have got when I pose this idea is that if something is worth doing (energy R&D in this case) we should simply appropriate money for that purpose. This is first a bit naïve, but beyond that, I would draw a parallel to “use” taxes here. We have many. Take, for example, gasoline and tire taxes targeted to highway construction and maintenance. Here, the “use” on point is the service of the atmosphere and oceans as disposals for CO<sub>2</sub>.

Carrying the analogy further, essentially what I am proposing would be similar to using some of the tire taxes to research how to make highways less pervious to heavy traffic. That seems a very sensible use for these funds.

Cost effective reduction of energy required for services is as beneficial as lower cost energy sources and should obviously be included in any energy research agenda. So, too, should pursuit of measures to capture CO<sub>2</sub> from flue gases or from the atmosphere and sequester them.

Without going too far into the weeds, I think goals are critical to any great endeavor, and lowering energy cost is the right goal here. Among considerations, I am very cognizant of the degree of difficulty in implementing any policy that begins to have a serious impact on life and economic well being. If such research efforts developed non carbon energy technologies that were also lower cost, they would be self implementing. The choice between economic welfare and environmental harm would be mooted. The private economic incentive would favor the non carbon energy choice. The difficulty of forcing adoption of low carbon technologies would be side stepped.

I am explicitly trying to formulate this idea while remaining agnostic with regard to the science. Still, it is difficult to evade the concern that science will ultimately buttress warming fears. In any case, a strategy is better if it is constructed so that it responds well to this challenge. Here, the tax approach is most beneficial. Should the need arise, the camel's nose is indeed under the tent, and the correct action is simply to increase the tax. Such an increase is about as transparent as public policy can be, rather than hidden like cap and trade allowance prices, which “just happen.” Given the potential breath and consequence of such a policy, the more transparent the policy, the better.

Surely there will be disagreement about the appropriate level of the tax. Even if the tax rate is low initially, this approach allows sequential decision-making if changes in the scientific assessment are for the worse. A number of future signal events can increase the public demand for action and support for tax increases. In the meantime, hopefully, the funded research will have found ways to reduce the cost of emission avoidance, meaning the higher tax should be lower than it would otherwise have been. That helps. If, in the unlikely event lower cost, non GHG energy technology has become available through R&D, the need for policy starts to vanish: simple economic incentives will enable the technology over time.

#### 4.4. *The carbon tax and the poorest among us*

It is almost tautological that around the world people are poor because they do not have access to energy resources that they can

afford. Thus, a substantial increase in energy R&D directed to the end of reducing energy cost is a fundamental attack on poverty. These are potential benefits enjoyed over and above and global warming gains.

But a more likely outcome is that, while research reduces the future cost of non GHG energy, it will be more expensive in the near term. This is undesirable. If GHG taxes are substantially raised, compliance with the tax coalition for nations with large numbers of poor will raise their citizens' bar for escaping poverty even higher. However, if increased revenues greatly exceed the needs for useful research (as is certain), these vast funds could be used for a number of purposes: general revenues partially offsetting existing taxes, or returned to citizens.

Another use, to the point, is to aid nations to implement low GHG energy technology as poverty needs dictate. This would not just be economic aid but would in fact be a deal.

The quid quo pro would be for poorer nations to join the coalition so that high GHG energy sources in these countries will be appropriately discouraged, but support is provided to implement low GHG technology and help provide poor citizens access to energy.

## 5. Conclusions and policy implications.

The policy approach outlined here begins with an explicit recognition of the high degree of uncertainty about the rate of global warming, as evidenced by dissonant results that have accumulated over the last number of years. That uncertainty suggests small steps rather than big bang bold steps and also implies that we have more time than initially thought to find ways to mitigate its impact. The underlying principle here is that it is better to take some prudent action even if small rather than argue over grandiose actions that fail to materialize.

The step proposed here, very modest carbon taxes, can be strategically crafted to strengthen and improve the search for low cost non GHG energy alternatives achieving dual desirable goals.

This is only a sketch of a plan and a number of things would have to be worked out. Among them should be a mechanism to sequester the research and development fund from political capture through earmarks and other logrolling. The effort I propose will likely fail if it becomes a “jobs” fund or a politicized industry subsidy program.

The IIASA Global Energy Assessment is an ambitious and well done study whose purpose is to identify means to provide world energy needs over the long term while meeting a target of limiting global warming to 2 °C. That report describes an Energy Technology Innovation System that may serve as a blue print for ensuring appropriate fund development and expenditure. (Grubler et al., 2012) No doubt one objection, from those strongly convinced of global warming danger, will be that this approach is insufficient for the problem at hand and will deflect from other efforts like renewable mandates and cap and trade. They will also argue that the tax should be much higher (Nordhaus, 2008).

This would be a more cogent objection were other efforts going well. Further, the proposed effort is modest enough at least initially that other initiatives could readily be continued.

The hope is that policy makers will see the advantages to the proposal presented here. It is low cost and therefore low risk; it is transparent; it builds in incentives for cooperation; it has the potential for ameliorating poverty; and, its objectives are supported by those on both sides of the climate change discussion. Because the approach is incremental, it will avoid the unintended consequences of other, more grandiose schemes that have sought to achieve similar goals. (A notable example of this is the ethanol program in the U.S. which resulted in increased hunger

worldwide) (Griffin and Soto, 2012). Finally, in the worst case scenario (or even middle case scenario) where the science becomes compelling, a mechanism is in place for immediate and forceful action.

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