The *Intelligent Community* Response To The *Pickens Plan*

Below is the *Intelligent Community* response to the *Pickens Plan*, T. Boone Pickens' answer to the peak oil crisis. If you are not familiar with the *Pickens Plan*, it can be briefly described as follows:

1) Take advantage of the wind corridor running down the middle of the United States, and build windmills to tap into that free energy.
2) Build an electric grid from these windmills to urban centers.
3) Use the energy saved by the windmills to free up natural gas currently used in electricity-generating plants, and use that natural gas to power cars.

In this short paper, we'll discuss our response to this plan.

The Good News (Part 1): The *Pickens Plan* is a model approach we can all learn from.

Well, it finally happened. An American citizen says "let's stop waiting for government to respond to the peak oil crisis – let's take action ourselves". What is especially notable is that the American citizen uttering these words is no ordinary American. This is T. Boone Pickens, one of the first people you think of when you hear the word "oil". Now, when a legendary Texas oilman tells you that "finding more oil is not the solution", you know you've turned an important cognitive corner. Finally, the American people have received their long-overdue "reality check", and now know that the "business-as-usual" media agenda of the last few years was fostering a "not-so-grand" illusion. In creating and promoting his plan, Pickens is telling us that the "business as usual" approach is a dead end, and that a new paradigm is needed. For this much needed reality-check, we must all offer him our collective thanks.

The Good News (Part 2): 2/3 of his solution is superb.

Pickens says that there is a wind corridor generating energy through the middle of the United States, and that we should tap into this energy by building windmills up and down that corridor. An excellent observation! He also says that we need to build out the electric grid to carry that power to urban centers. So far, Pickens is 2 for 2. If that was his entire plan, there wouldn't be any bad news.

The Bad News: 1/3 of his solution is not superb.

But that's not his entire plan. Along with the focus on tapping into wind power to generate energy, the *Pickens Plan* also mentions taking the energy saved by wind power (now generated by natural gas), and divert that natural gas into a fuel to power vehicles. Uh oh. Unlike the wind and grid proposals, this raises a red flag. Is this really the best possible solution? We will devote the rest of this article to looking at this natural gas recommendation more closely.

Natural Gas is nonrenewable; that's a problem.

Here's our first problem with natural gas; it's also a fossil fuel, and like oil, is also non-renewable. Is transitioning from one expensive fossil fuel to another really the solution we need? After all, non-renewable energy sources like natural gas are not perpetually available like wind and solar, they have an inherent supply risk: any shortage in supply can lead to sometimes enormous price increases, and world demand in the future could easily erase any present cost advantages. To take just one probable scenario, if natural gas for vehicles was really a good idea, the rest of the world would move to natural gas, and then the cost efficiency of natural gas would disappear.

Natural Gas still produces greenhouse gases; it is not "clean".

In the PDF on his website, Pickens states that "Natural gas is the cleanest transportation fuel today." That may be true, but that doesn't mean that natural gas is "clean". As a matter of fact, it's not even close to clean. In his document,

Pickens acknowledges that the greenhouse gas emissions from natural gas are "30% lower than gasoline." Seen the other way, this means that natural gas vehicles still produce 70% of the CO_2 produced by today's internal combustion engines. 70% dirty isn't "clean", its just less dirty, and if there are other alternatives which produce fewer greenhouse gases, by Pickens' own logic they ought to be implemented. But in Pickens' plan they are nowhere to be seen.

Natural Gas has other *present* uses and should be preserved for those purposes.

Besides its use as a fuel for generating electricity, natural gas is used for other purposes, for example, commercial cooling and cooking, for industrial purposes such as waste treatment and incineration, metals preheating (particularly for iron and steel), drying and dehumidification, glass melting, food processing, and fueling industrial boilers, as well as to manufacture certain chemicals and products, including plastics. Gases such as butane, ethane, and propane are extracted from natural gas to be used in the manufacture of products as fertilizers and pharmaceuticals. It is also used to run appliances and heat homes. Because it can't be replaced, or is difficult to replace for many of these purposes, it must be to that extent be preserved.

Because wind is intermittent, natural gas has a better *future* use than powering vehicles: as a backup for wind when it isn't blowing.

Pickens' Plan relies heavily on wind to generate electric power; this is good. However, one of the problems with wind is *intermittency*, which means that when the wind doesn't blow, power is not generated. This doesn't mean that wind is bad, but it does mean that any movement to wind requires a "backup plan". And what energy could be used for backup? The natural gas that Pickens would otherwise use to power automobiles! Natural gas is the perfect fuel for this purpose. Because natural gas and wind power are complementary to each other, natural gas turbines can be turned on and off quickly to work as a partner with wind to support electrical demand. The obvious and ideal use for natural gas apart from its legacy purposes is as a backup source to wind power, not to power cars.

Natural Gas burned in a car is more inefficient than that burned in a power plant, so why move natural gas from *efficient* power-generating plants to *inefficient* internal combustion engines?

Preliminary research by *Intelligent Communities* has uncovered the following statistic: that natural gas burned in a power-generating plant is *50%* efficient, but when it is burned in a car it is only *20%* efficient. We will be verifying and citing this statistic in a future revision of this document, but if it is true, it means the *Pickens Plan* is pursuing an inherently inefficient strategy.

The *Pickens Plan* needs expert analysis — we should not automatically embrace it without extensive scrutiny.

A plan (created by Pickens or anyone else) needs to be evaluated by engineers from the standpoint of cost-effectiveness and timeliness. If we can roll out another solution which achieves the same end-goal more quickly and more efficiently, we should choose that plan, and not just implement the first plan which comes our way.

The cost to make the transition to natural gas will be expensive: *very* expensive.

How expensive? Anywhere from $4 to $5 trillion dollars (200 million vehicles times $20,000 per vehicle + the cost of developing the new fueling infrastructure required to run vehicles on natural gas)[1]. At approximately 50% of our

[1] It is not necessary to purchase a compressed natural gas car, existing vehicles can be converted to CNG cars; however, that process is not inexpensive, the average cost is approximately $16,000 (See *http://www.greencar.com /features/natural-gas-conversions/* for conversion cost estimates). Our estimate assumes that 50% of cars would be purchased new (at an average cost of $24,000, and 50% would be converted). It is important to note that this ratio may

current National Debt, this is not a trivial expense[2]. If natural gas vehicles are not the best solution, this is, bluntly speaking, a waste of money.

The *Pickens Plan* does not leverage the existing electrical infrastructure.

Trillions of dollars have already been invested in America's electrical infrastructure (the "grid"). Natural gas does not leverage that infrastructure. It calls for new investment instead of leveraging our old investment in the grid, which could be accomplished by a counter-proposal to substitute PHEV-40 vehicles (plug-in hybrid electric vehicles which can go at least 40 mph on a single charge), and standard electric cars, for natural gas vehicles. Wind (and other renewable sources) can charge plug-in hybrids, and it is estimated that a PHEV-40 vehicle can reduce gas consumption by anywhere from 50 to 70% [http://www.nrel.gov/vehiclesandfuels/energystorage/pdfs/40847.pdf]. That's a solution capable of providing 0% greenhouse emissions relative to gas-powered cars, not 70%, as well as leveraging the existing infrastructure.

Trillions of dollars of natural gas infrastructure will have to be junked when natural gas becomes too expensive.

When natural gas becomes too expensive, we're then going to have to replace entire natural gas vehicle infrastructure with electric infrastructure. Since we're going to do that *anyway* at some point in the future, why not do it *now*, when the cost of building this infrastructure now is far less than it will be? We can use the money saved from not having to build natural gas vehicles to build solar thermal plants, as well as deriving energy from geothermal, wave, distributed photovoltaic, and many other sources.

The *Pickens Plan* is too focused on *centralized* power generation, and ignores *distributed* power generation.

Distributed power generation (such as solar thermal and photovoltaic) is located at the point of contact at the home. Solar thermal power can displace electricity for heating water, and this power can be used to charge electric cars instead. The redundancy created by a distributed power network (turning rooftops into power plants) makes America less vulnerable to enemy attacks.

The Ramp-up time issue is not dealt with by the *Pickens Plan*.

The U.S. has over 200 million light vehicles. Replacing these with natural gas vehicles will be time-consuming. This is time we may not have. We can cut petroleum-based gas use with other means that are much faster and much less expensive, which will give us the time we need to move to alternatives.

When all is said and done, we must realize that the *Pickens Plan* is not the comprehensive plan it should be.

The problem with the *Pickens Plan* is that there is too much *Pickens* and not enough *Plan*. It is a simple approach, but the simplicity leaves many gaps. A plan is comprehensive and detailed, and incorporates an array of approaches, with deadlines and milestones. It contains the analytic data that shows that future energy needs can be met at the lowest possible cost: the *Pickens Plan* does not do this. Because it is not actually a comprehensive plan, the *Pickens* approach

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be extremely optimistic, becuase even if the conversion cost turns out to be cheaper, few people will convert their cars until there is an existing natural gas infrastructure that will support long-distance travel.

[2] How big is this number? The thickness of a single one-dollar bill measures .0043 inches, and so the height of a stack of 1,000 one dollar bills measures 4.3 inches. The height of a stack of one million one-dollar bills therefore measures 4,300 inches, or 358 feet, which is about the height of a 35 story building. The height of a stack of 1,000,000,000 (one billion) one-dollar bills measures 358,510 feet, or 67.9 miles. This would reach from the Earth's surface into the outer layer of the Earth's atmosphere. The height of a stack of 1,000,000,000,000 (one trillion) one dollar bills measures 67,866 miles. This would reach more than one fourth the way from the surface of the Earth to the Moon. $4 Trillion dollars takes us past the moon. (From http://www.scoroncocolo.com/debt.html).

omits a whole host of cost-effective options, including moving businesses to telecommuting, reducing the workweek for those businesses creating carpooling software, intellitaxis, car sharing, movement to alternative vehicle types such as electric motorcycles, etc. Furthermore, the *Pickens Plan* does not address societal inefficiencies (i.e. magnet schools with kids coming from miles away, lack of HOV lanes, high schools which allow kids to park increasing auto use, businesses which operate in 5 day workweeks when only 4 are required, business which don't offer telecommuting, etc). These inefficiencies add enormous costs, and addressing these inefficiencies will be not only be cheaper but will achieve the desired result of displacing gasoline consumption more quickly.

Putting the *wrong* response in place is *not* a solution: putting the *right* response *is*.

If it is not comprehensive and omits options and advocates inefficient ideas, that plan is the wrong plan. Because of opportunity costs, putting the wrong plan in place will divert valuable resources away from the right plan, and that's not what we need. For example, if we can cut gas consumption by 50% simply by moving to telecommuting, which would cost millions of dollars, and not trillions like the natural gas option, we should.

There are better plans, and one of them is *Operation Energy Transition*.

So, if the *Pickens Plan* is inadequate, what plan is superior?

Pickens himself outlined parameters for other plans. In a news release, Pickens stated the following:

"I believe that elements of any realistic plan to reduce our deadly addiction to foreign oil should encompass the following:

- Will it slash oil imports by at least 30% in 10 years?
- Does it rely 100% on domestic energy resources?
- Does it rely on existing and proven technologies?
- Can it be on line within 10 years?
- Can it be done by private investment?"

(Press release dated July 17, 2008, business wire, http://www.marketwatch.com/news/story/t-boone-pickens-responds-al/story.aspx?guid={F636D10C-E2D8-4F43-86F5-E3D22FEFFB32).

There are at least 3 other plans which meet these criteria. The first is *Plan B*, formulated by Lester Brown, which pools conservation with a movement to alternate energy sources. The second is *Plan C*, by Pat Murphy, which posits as a solution a form of extreme conservation which he refers to as *curtailment*. And then there is a third plan proposed by *The Intelligent Community Initiative*, called *Operation Energy Transition*. *Operation Energy Transition*, currently under preparation and in an early draft stage, incorporates the best aspects of the *Pickens Plan* as well as *Plan B* and *Plan C*, and additional ideas. It is, however, much, much cheaper than the *Pickens Plan*, and will work much faster because it contains an implementing strategy known as the *Intelligent Community Initiative*.

Operation Energy Transition is vast in scope, and is best appreciated by reading more detailed documents, including a wall map, which can be found at **www.theintelligentcommunity.com**.