TO: Senator Barack Obama and Senatorial staff
SUBJECT: Introducing coal-to-liquids incentives into the compromise H.R. 6 bill

**Executive Summary**

The United States is in the midst of a national security, energy, and climate crisis that demands significant attention from elected leaders. In the past, the U.S. has made attempts to use its huge coal reserves (more than a quarter of total world reserves)[1] to create liquid fuels to solve energy problems and their attendant national security issues. However, all political attempts to create a coal-to-liquids (CTL) industry have failed. Just this year, your joint offering of CTL incentives, S. 133, with Jim Bunning has not been passed and a number of related amendments in both the House and Senate have failed as well. The reasons so far appear to be Democratic energy leadership's unwillingness to consider the issue before the fall and disagreement over the requirements to capture and sequester $CO_2$ from the process and the mechanisms involved in the incentives. However, 69 Senators voted for one of the two CTL amendments to H.R. 6 in June, suggesting that this issue has legs.

As a result, you should seize this opportunity to negotiate a bipartisan supported set of incentives intended to promote an environmentally friendly CTL industry to include in the final H.R. 6 bill (see Appendix II for details). Doing so will allow you to take serious steps towards solving national security and climate change problems and achieve major political gains that will be invaluable in your bid for the presidency.

On the technical side, CTL has the ability to replace up to 30% of imported oil by 2030, putting us on the way to independence from foreign oil.[2] CTL also has the ability to reduce $CO_2$ emissions when paired with carbon capture and sequestration (CCS) and a biomass (non-food) co-feed. RAND predicts that with a 50%-50% mix of coal to biomass and CCS that emissions could actually be negative.[3] In addition, CTL can enable biomass-to-liquids (BTL), which will be able to take advantage of the negative emissions from biomass earlier than cellulosic ethanol.[4] The overarching barrier to CTL producers is the high amounts cost of market entry and their inability to obtain it from lenders. Carefully crafted government incentives would help to eliminate this problem and incentivize environmentally beneficial configurations of CTL.

On the political side, the gains would be tremendous for your presidential campaign. Negotiating a bipartisan supported set of CTL incentives would enhance your status as a consensus builder, boost your credibility on national security issues, and allow you to take credit for economic expansion. This last piece will especially help you in coal swing states, which account for 149 electoral votes, and in the primary in Iowa, which has significant coal and biomass. Adding CTL may also help to overcome opposition to the bill by Republican lawmakers and the President by appealing to coal interests, allowing you to take some credit for its passage. You will likely take a hit from environmental groups, which oppose CTL of any kind, but framing the issue around $CO_2$ emissions reductions and BTL should help.

CTL incentives will face implementation problems, however. The purpose of the incentives could be unclear to the Department of Energy (DOE), operational demands will be high and could interfere with DOE standard operating procedures, monitoring lifecycle $CO_2$ emissions will require significant DOE resources in the form of staff, expertise, and equipment, the incentives will depend on future politicians to continue them, and the measures will likely be challenged in court. However, these problems can be overcome with clear directives, Congressional review, additional funding, and building up political support within the policy community for CTL incentives.

**Background**

The United States is in the midst of a national security, energy, and climate crisis that demands significant attention from elected leaders. In the past, the U.S. has made attempts to use its huge coal reserves (more than a quarter of total world reserves)[5] to create liquid fuels to solve energy problems and their attendant national security issues. Such efforts began in 1944 with the U.S. Synthetic Liquid Fuels Act, which authorized the Secretary of the Interior to construct synthetic liquid fuel plants to aid in the prosecution of WWII.[6] In 1980, Congress created the U.S. Synthetic Fuels Corporation, which was disbanded in 1985, to financially assist companies in the creation of coal-to-liquids (CTL).[7] Finally, two years ago, the Energy Policy Act of 2005 included initiatives allowing the Secretary of Defense to create a CTL policy, directing the Department of Energy to evaluate production of CTL from Illinois Basin coal (a product of Obama's fine efforts), and authorizing the Secretary of Energy to provide loan guarantees to CTL companies.[8] All of these failed, the most recent because of a lack of dedicated funding.

This year has been no different. Barack Obama's joint offering with Jim Bunning (R-KY), S. 133, attempted to establish CTL incentives totaling around $8 billion, though with no stipulations on $CO_2$ emissions.[9] Since in its pure form, CTL could create close to twice the lifecycle $CO_2$ emissions of regular gasoline, environmental groups such as the Sierra Club came out against the bill.[10] As Obama has since qualified his support for the bill, it has gone nowhere. In the House, a number of amendments to energy legislation over the summer were rejected because of Democratic leadership's wish to consider the issue in the fall.[11] In the Senate, during consideration of H.R. 6 (The CLEAN Energy Act) in June, two amendments promoting CTL were defeated because of partisan disagreements over requirements to capture and sequester $CO_2$

and mechanisms to promote CTL productions. Both called for a 20% reduction in lifecycle $CO_2$ emissions, but the Republican proposal would have created a 6 billion gallon CTL mandate by 2022, while the Democratic proposal would have required 75% of the production $CO_2$ to be captured and sequestered and provided only $10 million in loans.[12] 69 Senators voted for at least one of the amendments, however, implying that the issue has legs.[13]

After a lengthy delay, Democrats have finally reached an agreement on fuel efficiency standards to be included in the final version of H.R. 6. The House expects to vote on the bill sometime during the week of December 3rd and the Senate timeline has not been determined.[14] While the current compromise bill does not currently contain anything on CTL, there is still time to influence negotiations.[15] Many, including Senator Charles Grassley (R-IA), view the inclusion of CTL as necessary to actually pass the bill.[16]

**Recommendation**

Obama should seize this opportunity to negotiate a bipartisan supported set of incentives intended to promote an environmentally friendly CTL industry to include in the final H.R. 6 bill (see Appendix II for details). Doing so will allow Obama to take serious steps towards solving national security and climate change problems and achieve major political gains that will be invaluable in his bid for the presidency.

**Technical Feasibility**

CTL has the potential to play a substantial role in solving national security problems, as well as in reducing U.S. $CO_2$ emissions. Many current national security problems are caused or are being exacerbated by reliance on foreign oil. Money from oil purchases in the Persian Gulf directly funds terrorist networks. Continued American presence in the Gulf region serves as a recruitment tool for Al-Qaeda. Oil-exporting states have significant leverage over the U.S.

Democratic institutions are undermined by oil rents.[17] Fortunately, according to the July 2006 American Energy Security Study of the Southern States Energy Board (a non-profit organization representing the governors of 16 southern states from Virginia to Texas), nearly 30% of oil imports could be replaced with CTL by 2030.[18] Although the study was 40% funded by Peabody Energy, the world's largest coal company, and the National Mining Association[19], any reduction of oil imports by close to that amount would yield huge national security gains.

Further, contrary to popular belief, CTL can help in the fight against climate change. Though CTL would entail an increase in the amount of coal mining, which entails a number of negative environmental effects, the fuels produced would be ultra-low sulfur (since it must be removed during the liquefaction process) and can have lower lifecycle $CO_2$ emissions than gasoline. When CTL is created without any CCS or biomass co-feed, a group at the Princeton Environmental Institute found that it produces around 1.77 times the lifecycle $CO_2$ of gasoline. However, when CCS is used, the level is 1.08 and when CCS and biomass (non-food) co-feed are used, the level is 0.21.[20] RAND, a non-profit think-tank, has found that with a 40%-60% mix of coal to biomass, CTL lifecycle $CO_2$ emissions would be roughly equivalent to normal gasoline and a 50%-50% mix with CCS would yield negative emissions.[21] The technology for CTL is mature, but the process of introducing biomass as a co-feed is less so.[22]

Finally, CTL would help to "enable" the production of biomass-to-liquids (BTL). BTL will likely be commercially viable in a shorter time frame (5 years) than cellulosic ethanol (10+ years).[23] Using biomass in biomass-to-liquids would, therefore, help to capture the benefits of biomass (negative lifecycle emissions) earlier. Using coal and biomass together would reduce fuel delivery costs inherent to BTL, allow large plants for increased benefits of economies of

scale, and reduce uncertainty of BTL feedstock supply, since biomass would be vulnerable to weather fluctuations.[24]

The overarching problem with capturing these benefits of CTL is the huge cost of market entry. To build a factory producing 30,000 to 40,000 barrels of liquid fuels per day costs $3 to $6 billion dollars.[25] With such high sums required, it appears unlikely that private industry will be able to obtain the necessary funding because of three uncertainties: cost and performance of CTL facilities, future oil prices, and how $CO_2$ will be regulated in the U.S.[26] To mitigate these risks and achieve the technical gains listed above, government incentives, such as loan guarantees and production incentives, will be necessary. These incentives can be scaled to lifecycle $CO_2$ emissions reductions to incentivize environmentally beneficial CTL configurations.

**Political Feasibility**

Obviously, Obama's major political concern has shifted from maintaining his Senate career to achieving the Presidency. According to the most recent USA Today/Gallup poll, Hillary Clinton (D-NY) still maintains a large lead in the primary campaign (39% to 24% for Obama).[27] With less than a month to go before the first primary, the time for bold steps is now.

As stated earlier, there is already fertile ground for action on CTL. Something on CTL will most likely come out of this Congress, it is just a question of how it is shaped and who will do it. If Obama were to seize the issue, he could point CTL in a politically beneficial direction and capture most of the benefits. Immediately upon achieving a bipartisan agreement on incentives, Obama could hold the achievement up as an example of how he is a consensus builder and a new breed of politician. Further, it would show that he is willing to take significant steps towards greater national security. A Rasmussen Reports poll shows that national

security/war on terror is very or somewhat important to 88% of voters, and only 44% of voters trust Democrats more than Republicans on the issue (46% feel the opposite).[28] This suggests that there is still valuable room for Democrats in general to improve on this issue. Finally, Obama could take credit for the significant economic development that a CTL program would produce. A CTL industry would create skilled jobs and help to alleviate economic hardships in depressed coal regions, as Rentech (a nascent CTL company) is planning to do in areas of Mississippi and Illinois.[29] By eliminating a substantial portion of oil payments going overseas and directing them to U.S. energy companies, Obama could take credit for economic expansion within the country (and within his own coal-rich state of Illinois). Further, coal companies have had an increasingly difficult time selling high-priced, high-sulfur coal from Central Appalachia to electric utilities because of federal acid rain regulations. Utilities, instead, have been turning to lower-priced coal in the West that contains less sulfur.[30] CTL would create vast new markets for this coal. The economy, as it always is, remains important in the minds of Americans, as a Rasmussen Reports poll shows that 97% of respondents view the economy as very or somewhat important in the coming elections.[31] All of these points should figure prominently in both the primary and general Presidential elections.

More specifically, these economic gains would be extremely helpful in securing votes for the general election (as well as in the primaries) from swing states with coal reserves such as Arkansas, Colorado, Indiana, Iowa, Kentucky, Michigan, Missouri, New Mexico, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.[32] Together these states account for 149 of the 538 total delegates of the Electoral College.[33] Capturing these states should be high priority in what could be a tight general election.

Even more important, however, may be the potential political gains in Iowa. Though there currently is no coal mining in Iowa, the state used to maintain a thriving coal industry, which declined during the 1980s following the country's shift to western coal,[34] and contains over 1.1 billion short tons of recoverable reserves.[35] In addition, Iowa ranks first in raw biomass production across the nation and can produce 32.7 million dry tons of biomass per year,[36] making it a prime target for a coal+biomass-to-liquids industry. It goes without saying that the state is also extremely important in the Democratic primaries, as it has the first. Given Clinton's large national lead, many believe that Iowa to be the best opportunity for Obama to make up ground.[37] This race is much closer than the national election, thankfully, with a Rasmussen Reports poll showing Hillary with a slim lead of 27% vs. 25% for Obama.[38] Framing this decision as a job creating opportunity for Iowa could help boost Obama's chances in the state.

Further, if Obama is able to negotiate a compromise on CTL, it could help to actually get H.R. 6 passed and he could claim much of the success. After the announcement of a deal on the general framework of H.R. 6, a number of Republican lawmakers and the President's economic advisor, Al Hubbard came out against the compromise. A source of much of the opposition is the inclusion of a Renewable Portfolio Standard (RPS), which would mandate increasing generation of renewable electricity.[39] Adding a CTL provision, however, could help tip the scales in favor of passage. The Southern States Energy Board has come out dramatically in favor CTL, suggesting that the represented states, which are against RPS because of a perceived lack of renewable sources, would benefit from CTL provisions. Also, the President has previously supported CTL[40] and its inclusion could make the bill easier for him to sign. Achieving these goals would increase Obama's standing in national politics, further show that he

is a "new breed" of politician, and allow him to take greater credit for the political success of the entire energy bill.

Despite these gains, however, Obama will likely take a hit from environmental groups as a result of his stance. Some groups, such as the Natural Resources Defense Council, have argued that the environmental impacts of coal mining are too great to allow any CTL development.[41] In addition, some groups, such as the Center for American Progress have argued that CCS, because of its expense, should be put to use in more efficient ways, such as in electricity generation.[42] Finally, over the summer, 14 environmental groups signed and circulated a letter this summer calling any provision for CTL "a poison pill that would make any bill totally unacceptable."[43] In general, therefore, it should be noted that environmental groups are against any form of CTL. Even so, Obama should pursue this course of action. His League of Conservation Voters rating is 100 for 2006, meaning he already has a lot of environmental political capital and can afford to take a hit. In addition, Obama should frame his decision in a positive environmental light. Since the big environmental issue of the moment is climate change (and not the environmental impacts of coal mining), he could point out the potential lifecycle $CO_2$ reductions from the many configurations of CTL mentioned above and argue that by taking control of the issue, he is better able to direct CTL towards those configurations. Most importantly, he should emphasize the ability of CTL to enable BTL. Finally, he could point out in his defense that, in June, his main competitor, Hillary Clinton, voted for the Democratic amendment to H.R. 6 promoting CTL (as did Obama).[44] This should provide him with some political cover.

**Administrative Feasibility**

It is important to note, however, that this program of CTL incentives (see Appendix II for details) could face a number of significant implementation problems, spanning communications,

operational demands, resources, and shared authority. In terms of communications problems, the Department of Energy (DOE) could be unclear of the purpose of these programs, given that there would be little legislative record, such as committee reports, to explain the motivations behind the incentives. For example, it is possible that the DOE would emphasize production in its distribution of incentive payments and ignore environmental protection because of confusion over its mandate. It would be useful, therefore, to include a statement of purpose in the compromise bill or in a following resolution to ensure that the DOE knows that its purpose lies beyond simply ramping up production of CTL, but to also require compliance to $CO_2$ lifecycle requirements.

The operational demands of the proposed measures will likely be high. To qualify for incentives under the proposed measures, a company must attain a lifecycle $CO_2$ reduction of 20%.[45] DOE will need to first evaluate whether proposed project plans will achieve those reductions and then perform follow up monitoring to ensure that those reductions have actually been met. This will be a very difficult task, as it involves complex lifecycle analysis that may need to be refined for these purposes. In addition, the activity of monitoring environmental impacts (in this case $CO_2$ emissions) before distributing production incentives may well run counter to DOE's standard operating procedures (SOPs). DOE is certainly not the EPA and may well find its new task onerous and contrary to their usual goal of increasing energy production, leading to resistance to implementation. These two problems can be managed, however, if DOE is directed (with appropriate additional funding) to create a standard lifecycle analysis model within a year and if Congress follows up with regular review of the implementation, using funding cuts as a potential stick.

This required monitoring, however, will also create resource problems. To perform this analysis of CTL projects, DOE will need significant numbers of expert staff members and additional equipment. This could be helped along with additional funding for the hiring and training of experts in CTL technology, as well as for the purchase of required equipment. Further, CTL projects that would qualify for incentives will likely emerge slowly, giving DOE time to develop the expertise needed to fully implement the program.

Finally, implementation of CTL incentives will create significant shared authority problems. DOE will be dependent on Congressional and Presidential support to receive future funding for these programs. To create a truly robust CTL industry, incentives will have to last beyond a single election cycle. In addition, environmentalist groups may try to block the implementation of CTL incentives by taking DOE to court, tying up the already busy agency in court battles and possibly delaying the process of implementation. To overcome these will require personal action on the part of Obama and other CTL stakeholders to generate widespread and long lasting support within the policy community. Only such support will sustain the policies through multiple election cycles and lengthy court battles.

**Conclusion**

Overall, therefore, Barack Obama should negotiate a bipartisan compromise on CTL incentives within the compromise H.R. 6 bill. In doing so, he can help to solve the national security and climate problems, as well as seize a number of political benefits, including electoral boosts from his new brand of consensus politics, national security strength, economic foresight, and environmental stewardship. It should also help to simply pass the bill. Though such a policy program will likely face hard implementation problems across the spectrum, sufficient mandates and funding should compel DOE to implement efficiently. Now is the time for action.

## Appendix I

In this paper, Barack Obama (D-IL) is advised on the subject of coal-to-liquids (CTL) incentives. He is the junior senator from Illinois, elected in November 2004 after a seven year stint in the Illinois State Senate. He won 70% of the vote in a landslide victory after the Republican candidate, Jack Ryan, was forced to withdraw following a sex scandal.[46] He is currently pursuing the Democratic nomination for president, polling second behind Hillary Clinton with 24% to her 39%.[47] He was involved in promoting his state's struggling coal industry as a state senator and introduced the American Fuels Act, which did not include environmental safeguards, on January 4, 2007 to promote CTL. [48] Since that time, he has received significant criticism from environmental groups and now states that he will only support CTL incentives with a 20% decrease in lifecycle $CO_2$ emissions relative to gasoline.[49] In June, he voted for an amendment to H.R. 6 that would have created incentives with a 20% decrease in lifecycle $CO_2$ emissions. The League of Conservation Voters awarded him a 95 rating in 2005 and 100 in 2006, generally approving of his environmental policies.[50] He is not heavily funded by energy interests ($489,909 of a total of $59,661,650)[51], though the 6th largest donor ($194,750) to his presidential campaign is the Illinois utility Exelon[52], which could conceivably receive CTL incentives.

The decision presented takes place early in the week of December 3rd, 2007. The deal over CAFÉ standards within the H.R. 6 compromise bill has been reached, but the full compromise bill has not been finalized, nor has it been voted on. The decision will be made within the informal negotiations that went on in lieu of a formal conference between the House and Senate.[53]

## Appendix II

Brief Outline of CTL Incentives

**Requirement**: In order to receive these incentives, CTL companies must achieve a reduction in lifecycle $CO_2$ emissions of 20% relative to conventional gasoline.[54]

**Funding sources:** All funding for incentives is incremental to DOE's existing budget.

**Purpose statement:** These provisions are for the creation of a robust coal-to-liquids (CTL) industry within the United States with the purpose of increasing energy independence, strengthening national security, and reducing emissions of energy related greenhouse gases.

I.) The Department of Energy will make available loan guarantees for CTL projects.

II.) The Department of Energy will provide production subsidies for CTL scaled to the price of oil.

III.) The Department of Energy will provide larger loan guarantees and production subsidies for CTL producers that achieve even greater lifecycle $CO_2$ emissions reductions than required.

IV.) The Department of Energy will be allocated funds for and mandated to create a lifecycle $CO_2$ analysis method for use within one year.

V.) The Department of Energy will be allocated funds for hiring and training staff and purchasing equipment for the monitoring of lifecycle $CO_2$ emissions from CTL projects.

Note: This outline is only one of a number of possible outcomes. The exact funding and measures to be enacted will emerge from bipartisan negotiation.

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[54] This is the level that Obama requires for support of CTL incentives, per phone interview of Obama LC Amrit Mehra on December 6, 2007.