### AT: Ethanol Thing

#### Coal outweighs ethanol

Hansen, Director of Nasa's Goddard Institute for Space Studies, 09

(Coal-fired power stations are death factories. Close them, www.guardian.co.uk/commentisfree/2009/feb/15/james-hansen-power-plants-coal

A year ago, I wrote to Gordon Brown asking him to place a moratorium on new coal-fired power plants in Britain. I have asked the same of Angela Merkel, Barack Obama, Kevin Rudd and other leaders. The reason is this - coal is the single greatest threat to civilisation and all life on our planet. The climate is nearing tipping points. Changes are beginning to appear and there is a potential for explosive changes, effects that would be irreversible, if we do not rapidly slow fossil-fuel emissions over the next few decades. As Arctic sea ice melts, the darker ocean absorbs more sunlight and speeds melting. As the tundra melts, methane, a strong greenhouse gas, is released, causing more warming. As species are exterminated by shifting climate zones, ecosystems can collapse, destroying more species. The public, buffeted by weather fluctuations and economic turmoil, has little time to analyse decadal changes. How can people be expected to evaluate and filter out advice emanating from those pushing special interests? How can people distinguish between top-notch science and pseudo-science? Those who lead us have no excuse - they are elected to guide, to protect the public and its best interests. They have at their disposal the best scientific organisations in the world, such as the Royal Society and the US National Academy of Sciences. Only in the past few years did the science crystallise, revealing the urgency. Our planet is in peril. If we do not change course, we'll hand our children a situation that is out of their control. One ecological collapse will lead to another, in amplifying feedbacks. The amount of carbon dioxide in the air has already risen to a dangerous level. The pre-industrial carbon dioxide amount was 280 parts per million (ppm). Humans, by burning coal, oil and gas, have increased this to 385 ppm; it continues to grow by about 2 ppm per year. Earth, with its four-kilometre-deep oceans, responds only slowly to changes of carbon dioxide. So the climate will continue to change, even if we make maximum effort to slow the growth of carbon dioxide. Arctic sea ice will melt away in the summer season within the next few decades. Mountain glaciers, providing fresh water for rivers that supply hundreds of millions of people, will disappear - practically all of the glaciers could be gone within 50 years - if carbon dioxide continues to increase at current rates. Coral reefs, harbouring a quarter of ocean species, are threatened. The greatest danger hanging over our children and grandchildren is initiation of changes that will be irreversible on any time scale that humans can imagine. If coastal ice shelves buttressing the west Antarctic ice sheet continue to disintegrate, the sheet could disgorge into the ocean, raising sea levels by several metres in a century. Such rates of sea level change have occurred many times in Earth's history in response to global warming rates no higher than those of the past 30 years. Almost half of the world's great cities are located on coastlines. The most threatening change, from my perspective, is extermination of species. Several times in Earth's history, rapid global warming occurred, apparently spurred by amplifying feedbacks. In each case, more than half of plant and animal species became extinct. New species came into being over tens and hundreds of thousands of years. But these are time scales and generations that we cannot imagine. If we drive our fellow species to extinction, we will leave a far more desolate planet for our descendants than the world we inherited from our elders. Clearly, if we burn all fossil fuels, we will destroy the planet we know. Carbon dioxide would increase to 500 ppm or more. We would set the planet on a course to the ice-free state, with sea level 75 metres higher. Climatic disasters would occur continually. The tragedy of the situation, if we do not wake up in time, is that the changes that must be made to stabilise the atmosphere and climate make sense for other reasons. They would produce a healthier atmosphere, improved agricultural productivity, clean water and an ocean providing fish that are safe to eat. Fossil-fuel reservoirs will dictate the actions needed to solve the problem. Oil, of which half the readily accessible reserves have already been burnt, is used in vehicles, so it's impractical to capture the carbon dioxide. This is likely to drive carbon dioxide levels to at least 400 ppm. But if we cut off the largest source of carbon dioxide - coal - it will be practical to bring carbon dioxide back to 350 ppm, lower still if we improve agricultural and forestry practices, increasing carbon storage in trees and soil. Coal is not only the largest fossil fuel reservoir of carbon dioxide, it is the dirtiest fuel. Coal is polluting the world's oceans and streams with mercury, arsenic and other dangerous chemicals. The dirtiest trick that governments play on their citizens is the pretence that they are working on "clean coal" or that they will build power plants that are "capture-ready" in case technology is ever developed to capture all pollutants. The trains carrying coal to power plants are death trains. Coal-fired power plants are factories of death. When I testified against the proposed Kingsnorth power plant, I estimated that in its lifetime it would be responsible for the extermination of about 400 species - its proportionate contribution to the number that would be committed to extinction if carbon dioxide rose another 100 ppm

#### Ethanol inevitable – international subsidies

Teslik, 08 – Assistant Editor at Council on Foreign Relations (Lee Hudson, “Food Prices”, 6/30/2008, http://www.cfr.org/publication/16662/food\_prices.html)

Before considering factors like supply and demand within food markets, it is important to understand the umbrella factors influencing costs of production and, even more broadly, the currencies with which and economies within which food is traded. Energy Prices. Rising energy prices have direct causal implications for the food market. Fuel is used in several aspects of the agricultural production process, including fertilization, processing, and transportation. The percentage of total agricultural input expenditures directed toward energy costs has risen significantly in recent years. A briefing from the U.S. Department of Agriculture notes that the U.S. agricultural industry’s total expenditures on fuel and oil are forecast to rise 12.6 percent in 2008, following a rise of 11.5 percent in 2007.

These costs are typically passed along to customers and are reflected in global spot prices (i.e. the current price a commodity trades for at market). The input costs of electricity have also risen, furthering the burden. Though it isn’t itself an energy product, fertilizer is an energy-intensive expense, particularly when substantial transport costs are borne by local farmers—so that expense, too, is reflected in the final price of foodstuffs. (Beyond direct causation, energy prices are also correlated to food prices, in the sense that many of the same factors pushing up energy prices—population trends, for instance, or market speculation—also affect food prices.) Currencies/Inflation. When food is traded internationally—particularly on commodities exchanges or futures markets—it is often denominated in U.S. dollars. In recent years, the valuation of the dollar has fallen with respect to many other major world currencies. This means that even if food prices stayed steady with respect to a basket of currencies, their price in dollars would have risen. Of course, food prices have not stayed steady—they have risen across the board—but if you examine international food prices in dollar terms, it is worth noting that the decline of the dollar accentuates any apparent price increase. Demand Demand for most kinds of food has risen in the past decade. This trend can be attributed to several factors: Population trends. The world’s population has grown a little more than 12 percent in the past decade. Virtually nobody argues that this trend alone accounts for rising food prices—agricultural production has, in many cases, become more efficient, offsetting the needs of a larger population—and some analysts say population growth hasn’t had any impact whatsoever on food prices. The shortcomings of a Malthusian food-price argument are most obvious in the very recent past. Richard Posner, a professor of law and economics at the University of Chicago, argues this point on his blog. He notes that in 2007 the food price index used by the FAO rose 40 percent, as compared to 9 percent in 2006—clearly a much faster rate than global population growth for that year, which measured a little over 1 percent. Nonetheless, experts say population trends, distinct from sheer growth rates, have had a major impact on food prices. For instance, the past decade has seen the rapid growth of a global middle class. This, Posner says, has led to changing tastes, and increasing demand for food that is less efficient to produce. Specifically, he cites an increased demand for meats. Livestock require farmland for grazing (land that could be used to grow other food), and also compete directly with humans for food resources like maize. The production of one serving of meat, economists say, is vastly less efficient than the production of one serving of corn or rice. Biofuels. Experts say government policies that provide incentives for farmers to use crops to produce energy, rather than food, have exacerbated food shortages. Specifically, many economists fault U.S. policies diverting maize crops to the production of ethanol and other biofuels. The effects of ramped-up U.S. ethanol production—which President Bush called for as part of an initiative to make the United States “energy independent”—was highlighted in a 2007 Foreign Affairs article by C. Ford Runge and Benjamin Senauer. Runge and Senauer write that the push to increase ethanol production has spawned ethanol subsidies in many countries, not just the United States. Brazil, they note, produced 45.2 percent of the world’s ethanol in 2005 (from sugar cane), and the United States 44.5 percent (from corn). Europe also produces biodiesel, mostly from oilseeds. In all cases, the result is the diversion of food products from global food markets, accentuating demand, pinching supply, and pushing up prices. Joachim von Braun, the director general of IFPRI, writes in an April 2008 briefing (PDF) that 30 percent of all maize produced in the United States (by far the largest maize producer in the world) will be diverted to biofuel production in 2008. This raises prices not only for people buying maize directly, but also for those buying maize products (cornflakes) or meat from livestock that feed on maize (cattle). Speculation. Many analysts point to speculative trading practices as a factor influencing rising food prices. In May 2008 testimony (PDF) before the U.S. Senate’s Committee on Homeland Security, Michael W. Masters, the managing partner of the hedge fund Masters Capital Management, explained the dynamic. Masters says institutional investors like hedge funds and pension funds started pouring money into commodities futures markets in the early 2000s, pushing up futures contracts and, in turn, spot prices. Spot traders often use futures markets as a benchmark for what price they are willing to pay, so even if futures contracts are inflated by an external factor like a flood of interest from pension funds, this still tends to result in a bump for spot prices. Still, much debate remains about the extent to which speculation in futures markets in fact pushes up food prices. “In general we [economists] think futures markets are a good reflection of what’s likely to happen in the real future,” says IFPRI’s Orden. Orden acknowledges that more capital has flowed into agricultural commodities markets in recent years, but says that he “tends to think these markets are pretty efficient and that you shouldn’t look for a scapegoat in speculators.” Supply Even as demand for agricultural products has risen, several factors have pinched global supply. These include: Development/urbanization. During the past half decade, global economic growth has featured expansion throughout emerging markets, even as developed economies in the United States, Europe, and Japan have cooled. The economies of China, India, Russia, numerous countries in Southeast Asia, Latin America, and Eastern Europe, and a handful of achievers in the Middle East and Africa have experienced strong economic growth rates. This is particularly true in Asian cities, where industrial and service sector development has clustered. The result has often been a boost for per capita earnings but a drag on domestic agriculture, as discussed in this backgrounder on African agriculture. Farmland has in many cases been repurposed for urban or industrial development projects. Governments have not, typically, been as eager to invest in modernizing farm equipment or irrigation techniques as they have been to sink money into urban development. All this has put an increased burden on developing-world farmers, precisely as they dwindle in number and supply capacity. Production capacity in other parts of the world has increased by leaps and bounds as efficiency has increased, and, as previously noted, total global production exceeds global demand. But urbanization opens markets up to other factors—transportation costs and risks, for instance, which are particularly high in less accessible parts of the developing world—and prevent the smooth functioning of trade, even where there are willing buyers and sellers. Weather. Some of the factors leading to recent price increases have been weather-related factors that tightened supply in specific markets.

In 2008, for instance, two major weather events worked in concert to squeeze Asian rice production—Cyclone Nargis, which led to massive flooding and the destruction of rice harvests in Myanmar; and a major drought in parts of Australia. Estimates indicate Myanmar’s flooding instantly destroyed a substantial portion of Myanmar’s harvest, limiting the country’s ability to export rice. Meanwhile, Australia’s drought wiped out 98 percent of the country’s rice harvest in 2008, forcing Canberra to turn to imports and further straining Asia’s rice market. Trade policy. Agricultural trade barriers have long been faulted for gumming up trade negotiations, including the Doha round of World Trade Organization talks. But in the midst of the recent food pinch, a different kind of trade barrier has emerged as a problem—export bans. As discussed before (in the instance of the Philippines meeting difficulty in its efforts to import rice), several exporters have tightened the reins in light of domestic supply concerns. According to the UN’s World Food Program, over forty countries have imposed some form of export ban in an effort to increase domestic food security. India, for instance, imposed bans on exporting some forms of rice and oil in June 2008—a move that took food off the market, led to stockpiling, and brought a spike in prices. China, Kazakhstan, and Indonesia, among other countries, have introduced similar bans. The distorting effects of these barriers are particularly troubling in the developing world, where a much larger percentage of average household income is spent on food. The African Development Bank warned in May 2008 that similar moves among African countries could rapidly exacerbate food concerns on the African continent. A group of West African countries, meanwhile, sought to mitigate the negative effects of export bans by exempting one another. Food aid policy and other policies. Experts say flaws in food aid policies have limited its effectiveness and in some cases exacerbated price pressures on food. CFR Senior Fellow Laurie Garrett discusses some of these factors in a recent working paper. Garrett cites illogical aid policies such as grants for irrigation and mechanization of crop production that the Asian Development Bank plans to give to Bangladesh, a densely populated country without “a spare millimeter of arable land.” Garrett also criticizes food aid policies (U.S. aid policies are one example) that mandate food aid to be doled out in the form of crops grown by U.S. farmers, rather than cash. The rub, she says, is that food grown in the United States is far more expensive, both to produce and to transport, than food grown in recipient countries. Such a policy guarantees that the dollar value of donations goes much less far than it would if aid were directed to funds that could be spent in local markets. Other experts note additional policies that limit supply. In a recent interview with CFR.org, Paul Collier, an economics professor at Oxford University, cites European bans on genetically modified crops as a prime example.

### AT: Solve Now

#### NRC can’t solve in time without reforms

Rosner & Goldberg, Physics Prof @ U Chicago, ’11

[Robert Rosner, William E. Wrather, Distinguished Service Professor, Departments of Astronomy and Astrophysics, and Physics at The University of Chicago, Director, Energy Policy Institute, Harris School of Public Policy, Stephen Goldberg, Professor of Law Emeritus at Northwestern Law, “Small Modular Reactors – Key to Future Nuclear Power Generation in the U.S.,” Energy Policy Institute at The University of Chicago, November 2011]

The NRC staff planning process for resolving SMR licensing issues appears to be transparent and methodical, with provision for participation by interested parties. However, a more focused, prioritized, and accelerated process likely will be needed to achieve the goal of a commercial U.S. SMR industry in the 2020 timeframe. For example, by seeking to address a very broad scope of issues affecting not only SMRs but also other advanced reactors, the NRC staff may not be able to give appropriate attention or priority to those issues of greatest importance to near-term SMR commercialization. In addition, the proposed sequencing of the white papers does not reflect any specific set of regulatory or SMR business priorities. Finally, the NRC staff plans would defer consideration of SMR issues affecting engineering design and economics, such as off-site emergency planning, decommissioning funding, and use of probabilistic risk assessment, until the stage of projectspecific COLAs. Another key SMR licensing issue, namely, the determination of the need for and value of licensing an SMR manufacturing plant, would be postponed until FY 2013 or later. The current NRC staff schedule would not permit full resolution of the inventory of SMR licensing issues in a timeframe to support SMR vendor development schedules. For example, both SMR vendors anticipate submitting DC documents to the NRC late in 2013, with the submission of COLAs as early as 2013. Preparation of NRC staff white papers in FY 2010 or FY 2013 would not provide the needed guidance to the vendors on a timely basis. Thus, meeting the objectives set forth in this strategic business plan will require some combination of an accelerated schedule, and a modified process that, as described above, will allow for case-bycase exemptions absent new regulations and guidance.

### Plan Key

#### Removing licensing is key – uncertainty

Campagna, Hyperion Chief Nuclear Officer, ’10

[Mark S. Campagna, Chief Operations Officer/Chief Nuclear Officer at Hyperion, “UTILIZATION OF NRC MANUFACTURING LICENSE FOR SMALL MODULAR REACTORS,” INTERIM REPORT OF THE ANS PRESIDENT’S SPECIAL COMMITTEE ON SMR GENERIC LICENSING ISSUES, July 2010]

Small modular reactors also differ commercially from the current generation of LWRs. Small modular reactors are factory built and may be fabricated entirely off‐site. The fabricated reactors will be shipped to a site for installation, which may include locations overseas. As commercialization proceeds, small modular reactor vendors may intend to fabricate small modular reactors without advanced long‐term orders for installation. As such, advanced site licensing with environmental reviews may not be viable. At the onset of the small modular reactor market, a clear understanding of the licensing process is needed to assist small modular reactor manufacturers as they proceed with the design, engineering, and manufacture of small modular reactor systems, structures, and components. Past consideration/use of the ML provision was not common. The NRC’s only experience with reviewing and issuing an ML occurred in the early 1980s (i.e., Offshore Power Systems’ ML‐1 for the Floating Nuclear Power Plant, issued in 1982). 10 CFR 52, Subpart F (Ref. 2), was not fully updated in 2007 when the NRC issued revisions to its streamlined power reactor licensing process including updating the DC and combined OL regulations to reflect lessons learned from initial licensing reviews. An ML could be a vital element of a small modular reactor vendor's technical/business plans and strategy in this endeavor. Successful development of the small modular reactor industry in the United States may turn on whether a clear licensing framework exists, perhaps utilizing the ML.

#### Need to get rid of staffing

Grenci, Westinghouse Principal Engineer, ’10

[Tony Grenci, Principal Engineer at Westinghouse Electric Company, “OPERATIONS STAFFING ISSUES RELATING TO SMRs,” INTERIM REPORT OF THE ANS PRESIDENT’S SPECIAL COMMITTEE ON SMR GENERIC LICENSING ISSUES, July 2010]

NRC regulations and policies stipulate operator staffing requirements for licensed nuclear reactor facilities. These requirements are based on experience with the operation of the large, base‐loaded reactors currently in use in the United States. These staffing requirements may not be appropriate or necessary for the new SMR designs, especially considering the simpler and more automated operation of these advanced designs. Additionally, excessive manning requirements need to be addressed early in the design review to avoid placing an undue economic burden on the operation of these SMRs, impacting the perceived viability of SMR vendors’ business plans. For example, using the staffing requirements in 10 CFR 50.54(m)(2)(i), a single‐unit 10‐MW(electric) Toshiba 4S reactor plant would be required to maintain four LOs per shift on‐site. Four on‐shift LOs translate into a combined operating staff of 40 to 80 personnel under current requirements. Considering the size and simplicity of the plant, and the minimal operator intervention necessary for either normal operation or accident response, this level of staffing is excessive. Using 10 CFR 50.54(m)(2)(i) to determine the staffing requirements for a NuScale design plant with twelve modules, for example, is even more problematic, as the table (see Appendix A) does not consider a plant arrangement with greater than three units (reactors) or all the modules being operated from a single control room. Regardless, extrapolating the requirements of 10 CFR 50.54(m)(2)(i) to a twelvemodule SMR facility would result in staffing numbers far in excess of those believed necessary to safely operate the reactor facility.