\*Warming Counterplan 1NC

Text: The United States federal government should substantially increase production tax credits for companies utilizing flywheels and for companies participating in flywheel hybridization research in areas other than wind or solar technology.

Flywheels solve vehicle efficiency better than any status-quo technology

Ellis in ‘6

[Chris Ellis, Chief Engineer of the Powerbeam Company, April 3, 2006, “Flywheel Hybrids,” http://www.hybridcars.com/related-technologies/flywheel-hybrids.html]

Hybrid engineers talk about Energy Supply Units (ESUs) and Surge Power Units (SPUs). ESUs can be gasoline engines, diesel engines, biofuel engines, fuel cell systems, gas turbines, or even plug-in batteries. Fierce arguments rage over the most appropriate choice for a particular application. In today’s production hybrids, the surge power for acceleration comes mainly from batteries. Imagine a car approaching a red traffic light. The driver touches the brake pedal gently, and the car eases to a stop. In a conventional vehicle, all its kinetic energy, i.e. the energy that is a function of its road speed and its mass, is thrown away, as heat from the brakes. This contrasts with a hybrid, in which the SPU collects as much of the vehicle's kinetic energy as it can, causing the vehicle to slow down as it does so, with the disk brakes held in reserve for an emergency stop. The SPU then stores the energy, until the vehicle moves off again, when the 'free' energy from the SPU is used in preference to fuel-expensive 'new' energy from the engine.

Tax incentives are critical to alternative flywheel development that solves the case

Lyon in ‘8

[August 26, 2008, Seeking Alpha, Phillip Lyon, http://seekingalpha.com/article/92665-beacon-power-my-top-stock-pick-for-2008]

Sure, flywheels are a nice technology for storing energy, and they might become a lot more popular if we get a huge tax incentive for people and businesses to shift to wind or solar power, or if the national power grid becomes increasingly unstable, and people/companies decide they must have more stable electric power. Otherwise, their major use is as backup power in corporate UPS systems, and must compete against batteries in that area. Flywheel energy storage offers a more cost-effective alternative to batteries+diesel generators when the cost of diesel fuel becomes prohibitive. Given the low amount of diesel fuel consumed by the typical corporate UPS facility (as utility power mostly works), it seems unlikely that this will drive BCON sales through the roof, as batteries+diesel generators are a much cheaper alternative to BCON's products.

Solves Wind/Solar Good 2NC

Flywheels massively increase the productive capacity of existing wind farms and solar power generators- that solves all of their reasons that wind and solar are good without needing to build major new wind or solar installations- only a risk that building those is bad

Efficiency Solvency 2NC

Counterplan solves best-

A.) Kinetic waste- inevitable in status quo technologies because no alternative tech captures unused kinetic energy involved in braking, starting the car up or other processes- Ellis evidence says that flywheels shore up any deficiencies in status quo technologies and solve warming

B.) Solves best- stores power better than any alternative

Bray in ‘8

[Hiawatha Bray, “Reinventing the Flywheel,” September 15, 2008, The Boston Globe, http://www.boston.com/business/technology/articles/2008/09/15/reinventing\_the\_flywheel/]

Even electric utilities can use a little extra power now and then. Usually, they get it by burning more coal, oil, or gas. [Beacon Power Corp.](http://finance.boston.com/boston?Page=QUOTE&Ticker=BCON) says it has a better idea: massive rotating flywheels that store power like giant alkaline batteries spinning at twice the speed of sound. "At the end of the day, it's a box of energy," said Bill Capp, president of the Tyngsboro company. The idea is to fill it up when power demand is low, by using electric motors to spin the flywheels. Then the whirling wheels are connected to generators to release the power when it's needed. Publicly traded Beacon Power has been around for 10 years and has invested $150 million in the concept, with hardly any revenue to show for it so far. Now, the company is building its first large-scale commercial system, capable of storing and releasing 5 million watts of power.

Efficiency Tradeoff 2NC

Efficiency is superior to renewables – programs trade off because renewables seem more attractive – Efficiency is cheaper and faster and solves All of the aff advantages and add ons

IHT in ‘7

The International Herald Tribune. October 31, 2007. [“Focus switches from light to bulb; Energy efficiency, instead of conservation, is the new mantra for governments” Lexis Nexis]

''Economics is the art of trade-offs, and as one resource becomes scarce you either figure out a way of producing more of that resource or you switch to other resources.'' Among alternative resources, renewable energies have a role to play, but no alternatives can replace efficiency as the top priority, said Ian Manders, deputy director of the Association for the Conservation of Energy, a British industry-supported lobbying group. ''Energy efficiency is not generally considered as sexy as renewable energy, but it's the first thing you do,'' Manders said. ''We have got to get used to using energy more efficiently. An industrial society lives on cheap energy, and when cheap energy goes, we'll have to use the energy we gain from renewable sources far more efficiently than we do by burning oil and gas.'' Renewables often have the disadvantage of expensive infrastructure, even if the ongoing fuel or power production is durable, other commentators noted. ''Efficiency is far more cost-effective and far more affordable and saves you a lot more money than renewable energy operations,'' said Gordes, in Connecticut, who has worked in both fields. Ferran Tarradellas Espuny, an energy spokesman for the European Commission, said, ''The benefits of energy efficiency are so high in terms of security of supply, in terms of reductions in carbon dioxide emissions and in terms of creating jobs and growth in the European Union that any measure that's aimed at efficiency is good.''

Economy Solvency 2NC

Flywheels are key to utilities sector efficiency- companies are developing ways to integrate now, but no profits means they are stalling.

Bray in ‘8

[Hiawatha Bray, “Reinventing the Flywheel,” September 15, 2008, The Boston Globe, http://www.boston.com/business/technology/articles/2008/09/15/reinventing\_the\_flywheel/]

Even electric utilities can use a little extra power now and then. Usually, they get it by burning more coal, oil, or gas. [Beacon Power Corp.](http://finance.boston.com/boston?Page=QUOTE&Ticker=BCON) says it has a better idea: massive rotating flywheels that store power like giant alkaline batteries spinning at twice the speed of sound. "At the end of the day, it's a box of energy," said Bill Capp, president of the Tyngsboro company. The idea is to fill it up when power demand is low, by using electric motors to spin the flywheels. Then the whirling wheels are connected to generators to release the power when it's needed. Publicly traded Beacon Power has been around for 10 years and has invested $150 million in the concept, with hardly any revenue to show for it so far. Now, the company is building its first large-scale commercial system, capable of storing and releasing 5 million watts of power.

Energy upgrades prevent blackouts

Ken Silverstein, EnergyBiz Insider July 2 2008 "Heat of Battle" <http://www.energycentral.com/centers/energybiz/ebi_detail.cfm?id=530>

To be sure, cost pressures still stand in the way of implementation. The old utility mindset reasoned that anything that cut consumption would hurt profits. But through a combination of regulatory moves and community pressures, they have come to realize that they, too, can save money by avoiding expensive and time-consuming build-outs. The California Energy Commission, for instance, credits demand response for avoiding the need to build 15,000 megawatts of new power plants since 1975. Similarly, ISO New England says that demand response programs would relieve congestion. Specifically, it said that the reduction of 50 megawatts in a congested zone would improve reliability by 30 percent. The threat of rolling blackouts would therefore diminish. Many utilities therefore are working with their state utility commissions to quantify the value of that benefit. The companies would like to pass through much of the cost of energy efficiency plans in the same manner they do other capital expenditures such as power plant and transmission development. While they understand such programs do not obviate the need for new infrastructure, the utilities reason that efficiency programs are far less costly and are effective tools by which they can meet environmental standards. "If energy efficiency is a production option, then we ought to be compensated," says Jim Rogers, CEO of Duke Energy. "It's dramatically cheaper than renewables."

Blackouts threaten the economy

AJC ‘8

The Atlanta Journal-Constitution February 22, 2005 Tuesday Home Edition SECTION: Editorial; Pg. 10A; LENGTH: 902 words HEADLINE: READERS WRITE BYLINE: CLINTON BASTIN, GLENN CARROLL, ERIC TAYLOR, LESLIE SORBELLO, MICHAEL FLORES, STAN WISE, BRENDA MOORE

Victor Davis Hanson's column ("California's big man wrestles big job," @issue, Feb. 21) would have been excellent if he had mentioned one important event: Californians replaced the 900-megawatt Rancho Seco Nuclear Power Plant with a two-megawatt solar electric generating plant. The consequent electricity shortages led to blackouts and necessitated purchases of natural gas at premium prices. The huge budget deficits, near bankruptcy of California and higher prices for natural gas were the end result.

Air Pollution Solvency 2NC

Flywheels are a cost effective form of alternative energy that’s key to solve pollution and increase alternative energy effectiveness- they empirically solve.

Harby in ‘7

[Karla Harby, The New York Academy of Sciences, “Flywheels Take Off,” December 21, 2007, http://www.nyas.org/ebrief/miniEB.asp?eBriefID=694]

The need for energy storage systems (ESSs) is growing. Utility companies need less expensive, less polluting, and more efficient systems for responding to rapid changes in load—both peaks and sags. Mass transit systems also require well-regulated energy supplementation during times of peak demand, and would benefit from capturing energy that is lost to braking. Many renewable energy sources (solar, wind, tidal) are intermittent in nature, and thus would be more useful and cost-effective if their energies could be captured and stored for later use. Popular energy storage systems, such as electrochemical batteries, have limitations that impair their usefulness for many applications. Batteries have relatively few charge-recharge cycles; they recharge slowly; they are temperature sensitive; and they often rely on chemicals that are not environmentally friendly. Because of technological advances, flywheel energy storage systems have become economically feasible for power grid and mass transit applications. Successful installations have been demonstrated in California and New York, as well as other areas. One of the largest commuter rail lines, the Long Island Rail Road, is preparing to install a flywheel energy storage system as a demonstration project.

A2: No Rare Earth Metals

Doesn’t take out the counterplan- no evidence that rare earths are specifically critical to flywheels- they don’t use complex mineral compounds, its mostly based on mechanical engineering to capture energy from motion

2NC CP Popular

Bipartisan support for incentives exist

**Mayer, 7 –** Money-in-politics reporter for Center for Responsive Politics (Lindsay Renick, PBS, “Big Oil Big Influence” 11-23-2007 <http://www.pbs.org/now/shows/347/oil-politics.html> )

The Democratic Congress has made clean energy legislation a priority because of rising gas prices and concerns about the nation's dependence on foreign oil sources, in addition to a scientific consensus that human activity is the root cause of today's global warming. Many Republicans, too, are on board and looking for solutions. "The single most important thing that's happened in the last five years is the price of oil has shot up," Stanford's David Victor says. "That run-up has changed the politics and incentives for people to take an interest in conservation, and that's completely bipartisan. There are people in the left wing and the right wing that say we need to do something about this problem."

**\* Victor is a law professor at Stanford University and a senior fellow on the Council for Foreign Relations.**

PTC is a popular approach to energy reform

Smith ‘5

Smith, 2005 (Don C., “RE Gains? The US Policy Act of 2005”, Science Direct, Volume 6 Issue 5, September)

When George W. Bush entered the White House in January 2001, one of his expressed goals was to push through a new energy policy. As a first step, the president assembled a major task force, headed by Vice President Dick Cheney, to study the country's energy situation. The aim was to prepare a strategy to “address the nation's energy needs for the 21st century.” Despite the president's investment of time and political capital, however, the energy bill stalled in the 107th and 108th Congresses. Nevertheless, this year the political climate changed and with - among other things - the support of more Republican members of the U.S. Senate the energy bill[1](https://webmail2.agoc.com/%20fn1)was passed. At the top of the list was the extension of the production tax credit (PTC) for wind energy and biomass electricity. Under the legislation, the “placed-in-service” date to which the 1.9 cents per kWh credit applies was extended through 2007. The credit applies over the first 10 years of a project's operation, and is a particularly critical factor in financing wind farms. Randell Swisher, American Wind Energy Association executive director, lauded this provision and said, “This is the first time that an extension of the production tax credit for wind energy has been approved before the credit expires, and, following the past six years of boom-and-bust cycles caused by successive expirations, that is very good news for the industry.” Consequently, the passage of the PTC portends strong growth momentum for wind energy at least in 2006 and 2007. The wind industry was also encouraged by provisions requiring that utility system reliability rules to be developed be non-discriminatory and that incentives be provided to encourage construction of new and upgraded transmission lines. “By requiring that new national reliability rules be non-discriminatory and by providing incentives to ease transmission bottlenecks, the [bill] chips away at two important barriers to continued wind energy development in this country,” Mr. Swisher said. “These long-term reliability and transmission provisions could help level the playing field and brighten the long-term planning horizon for wind power.” The bill also represented “the strongest national policy for solar power in two decades,” according to Rhone Resch, president of the Solar Energy Industries Association. For the first time since 1985, homeowners who install solar energy systems will receive a tax credit worth 30 percent of the system cost, capped at $2,000. Businesses that purchase solar equipment will also receive a credit worth 30 percent of the system cost. “These tax credits will bring solar power costs over the tipping point in many areas of the country,” Mr. Resch said.

2NC Solves Competitiveness

Creating new efficiency credits drives new employment and investment and solves their internal links

Prindle ‘7

Bill Prindle, 2007 Executive director American Council for an Energy-Efficient Economy [Hearing on Energy Innovations, http://commerce.senate.gov/public/index.cfm?FuseAction=Hearings.Testimon y&Hearing\_ID=f93eea0b-1cad-4881-8601-0c907c510d1c&Witness\_ID=4142c895-dcd2-4d1e-b69d-100e58e4fc66

Energy efficiency improvements have contributed a great deal to our nation’s economic growth and increased standard of living over the past 30 years. Energy efficiency improvements since 1973 accounted for approximately 50 quadrillion Btu’s in 2003, which is more than half of U.S. energy use and nearly as much energy as we now get annually from domestic coal, natural gas, and oil sources combined.[1] Thus, energy efficiency can rightfully be called our country’s largest energy source. If the United States had not dramatically reduced its energy intensity over the past 30 years, consumers and businesses would have spent about $650 billion more on energy purchases in 2006.Energy efficiency is measured not just in abstract terms like declining energy intensity, but also in concrete terms like product sales, job creation, and capital investment. ACEEE estimates that in 2006, total investment in energy supply systems, from pipelines to powerplants, totaled about $100 billion. But Americans also invest in energy-using technologies: energy-efficient products bearing the federal Energy Star label accounted for some $101 billion in sales last year, in a range of home and business products like home appliance, home electronics, heating and cooling systems, office equipment, lighting, and windows. These are large markets: our data show that, for example, that Americans buy some 11 million refrigerators, 64 million residential windows, 150 million pieces of office equipment, and about 1.5 billion light bulbs. We estimate that Energy Star products account for only about 1/3 of these markets in the aggregate, totaling some 330 million products, so one could project that total sales in these markets may be in the range of $300 billion annually. This suggests that, in rough terms, the U.S. economy spends perhaps three times as much per year on energy end-use technology as it does on energy supply technologies.

### \*\*\*AFF

### 2AC No Solvency

#### **Flywheels too bulky- haven’t worked for mass car or bus production**

Economist ‘11

Economist, Dec 3rd 2011, “Reinventing the wheel,” http://www.economist.com/node/21540386

A flywheel’s momentum can be increased either by making it heavier or by getting it to spin faster. In the past flywheels used for more ambitious energy-storing purposes have tended to be bulky. That is because at speeds above several thousand revolutions per minute (rpm) the materials they were made of could disintegrate. This made them practical for applications in which size does not matter much, such as balancing loads across power grids. They have only found one widespread use in transport: on trains, where they propel some locomotives across gaps in the power rail. Typically, that calls for wheels one metre across, weighing over 100kg—not counting the hefty casket in which they are encased for safety reasons. There have been attempts to use flywheels on big buses and trucks, but most involved devices which were only slightly less cumbersome. In smaller cars the extra weight negated any fuel-efficiency savings they might have brought. That, though, is finally beginning to change. One reason is that modern flywheels are increasingly being made of carbon fibre, a material much stronger than steel. This lets them whirr at over 60,000rpm without falling apart.

### Links to Politics

#### Tax Incentives links to politics- **Congressional rules require tax incentives to be paid for in the budget**

Geman 10

Ben Geman. 07/21/10 http://thehill.com/blogs/e2-wire/677-e2-wire/110003-senate-looks-to-debate-something-on-energy-

“The Senate bill could include more than $20B in tax credits for renewable energy and efficiency. Because Congressional rules require tax incentives to be ‘paid for’ with increases in revenue, Democrats expect to rescind existing incentives for the oil and gas industry to offset the cost,” FBR notes.

#### They face massive opposition in the current budget climate in Congress

Harder 10

MONDAY, NOVEMBER 29, 2010Can Tax Incentives Save Renewable Energy?

By Amy Harder http://energy.nationaljournal.com/2010/11/can-tax-incentives-save-renewa.php

Can tax credits, grant programs, and other federal initiatives sustain renewable energy development absent major legislation like a renewable electricity standard? If the 111th Congress takes up any type of energy legislation during its lame-duck session, it will be financial incentives tucked away in an omnibus tax extenders bill. About $7 billion in tax credits and grants for energy from solar, wind, geothermal, and ethanol are set to expire at the end of this year. Renewable and environmental groups are lobbying hard to get Congress to extend them, saying that if incentives aren't renewed, their nascent sectors will grind to a halt. If the credits aren't renewed by the end of this year, they'll likely hit steep opposition in the coming Congress, with its aggressive focus on slashing federal spending.

#### They require political capital

Schwartz 2k

Amy Ellen Schwartz, Ingrid Gould Ellen Brookings Institution

The Brookings Institution 2000 http://www.brookings.edu/articles/2000/summer\_cities\_ellen.aspx

The existing empirical evidence?albeit imperfect?suggests that although tax cuts may have a small effect on business location decisions, they do not appear to spur much economic growth. They work best in small areas, where they can attract businesses that would otherwise have set up shop nearby. Tax policy, in other words, is most effective in luring businesses from neighbors?not in attracting them from afar. Finally, as city leaders no doubt know, enacting tax cuts takes significant political capital, which may crowd out other interventions, such as altering the mix of taxes, say, toward taxing land value rather than property value.