## \*\*\* 1NC

### 1

#### Power in the federal government is divided into three branches—the affirmative does not specify

#### Voting Issue

#### One—negative ground—specification is key to generate specific uniqueness and link magnitude so generic energy production now doesn’t non-unique our disads. Gives us textual competition for counterplans and key to high tech solvency arguments

#### Two—education—specification is a prerequisite to energy policy.

Tomain 90—Professor of Law, University of Cincinnati College of Law [Tomain, Joseph P., “The Dominant Model of United States Energy Policy” (1990), Faculty Articles and Other Publications, Paper 130, http://scholarship.law.uc.edu/fac\_pubs/130]

IV. CONCLUSION

The direct message of the dominant model is that United States energy policy is market driven. The implication of this message is equally clear. Given the structural setting of a complex policymaking process that is woven throughout government and is directly affected by the tensions created by separation of powers and federalism, no comprehensive national energy policy of any detail is likely to develop despite executive, legislative, or administrative desires to do so.

There are ideological and pragmatic reasons behind this conclusion. The first reason, grounded in the liberal tradition, is that the country is "generally suspicious" of central planning. Rather than have an imitation Japanese or European industrial policy, the United States economy continues to run on private competition. Granted, the government will attempt to halt large accumulations of corporate power through antitrust enforcement. Still, though, countervailing government control of the economy through heavy central planning is simply not an accepted way of doing business.

A second and corollary reason is that although government is used as a backstop to prevent large aggregations of corporate power, government will also promote and support competitive businesses. The New Deal was not so much an experiment in social policythough it was clearly that-as it was an example of the federal government stimulating the economy by getting business on its feet again.

Third, there is a commitment to the hard energy path of largescale, high-technology, capital intensive energy production. This commitment finds its roots in the industrial revolution of the nineteenth century. This history makes it difficult for policy makers and decision makers to design and implement alternative energy policies, thus putting the burden of change on proponents 'of alternatives.

Fourth, also echoing the liberal tradition, there is an underlying faith in the market. The country's efforts to achieve the virtues of the market-color blindness, individual liberty, eqmility, and technological innovations-may not reach a Utopian plateau, but government controls are worse approximations. The country's faith in the market forms the baseline, and government will only intervene if cracks in the baseline are perceived.

Thus the dominant model of U.S. energy policy is firmly based in the tenets of democratic capitalism: private ownership and production; competition; no overt central planning; wariness of monopoly; and government support of each of the other elements. The hope is that our national economy and our quality of life can flourish if (1) markets are relatively clear, (2) entry and exits are relatively inexpensive, and (3) corporate power is relatively dispersed. Indeed, the ideology of domestic energy policy rests upon the idea that inter-industry and intra-industry competition are highly desirable~' Moreover, such industrial pluralism ultimately serves the public interest by providing relatively abundant energy at relatively stable prices. Economic efficiency, economic growth, economies of scale, and a cautious eye on market power thus define the public interest in energy. So says the dominant model. What remains to be seen is whether the dominant model has significant longevity given contemporary concerns about the continued use of fossil fuels and environmental degradation. Before the environmental consequences of hard path energy production can be adequately addressed, however, the dominant structure of domestic energy policymaking and policy must be acknowledged. Hopefully, this article has provided that acknowledgement.

#### 2AC clarifications are too late—the 1AC plan is used to generate counterplan competition—2AC or CX clarification justifies aff conditionality and kills any neg predictability

### 2

#### Interpretation

#### Financial incentives are tax incentives, grants, loans, rebates, industry recruitment, bonds, and production incentives.

DSIRE 12—Database of State Incentives for Renewables and Efficiency [DSIRE Clickable Incentives and Efficiency Map, http://www.mrsolar.com/content/dsire.php#.UBAIwrRCapW]

What types of renewable energy incentives does DSIRE track?

The DSIRE project tracks information on state, utility, local, and selected federal incentives that promote the use of renewable energy technologies. For more information on federal incentives, see What federal incentives does DSIRE track. On the DSIRE website, incentives are grouped into two categories as follows:

(1) Financial Incentives: tax incentives, grants, loans, rebates, industry recruitment, bond programs, and production incentives.

(2) Rules, Regulations, & Policies: public benefits funds, renewables portfolio standards, net metering, interconnection, extension analysis, generation disclosure, contractor licensing, equipment certification, solar/wind access laws, and construction & design standards (including building energy codes and energy standards for public buildings), required utility green power options, and green power purchasing/aggregation policies.

#### Nuclear power is production of electricity.

International Energy Agency, no date. Energy Statistics and Balances of Non-OECD Countries, Energy Statistics of OECD Countries, and Energy Balances of OECD Countries. http://www.indexmundi.com/facts/united-states/electricity-production-from-nuclear-sources.

Definition: Sources of electricity refer to the inputs used to generate electricity. Nuclear power refers to electricity produced by nuclear power plants.

#### Energy production in the context of nuclear power means net electricity generation.

Energici, February 2012. Provides business intelligence and decision support services to companies and investors active in the wind, solar, hydro, geothermal and bioenergy industries. Specializes in providing robust research, analysis and intelligence coverage of trends and developments. \*All information sourced from EIA. “PRIMARY ENERGY PRODUCTION (MONTHLY),” http://www.energici.com/energy-profiles/by-country/europe-m-z/sweden/49-countries/north-america/usa/usa-geothermal/449-primary-energy-production.

Definition : Primary Energy Production is the amount of energy converted from a primary energy source in its natural state, such as coal, gas, wind etc. that has not been subjected to any conversion or transformation process. The U.S. Energy Information Administration includes the following in U.S. primary energy production: coal production, waste coal supplied, and coal refuse recovery; crude oil and lease condensate production; natural gas plant liquids production; dry natural gas—excluding supplemental gaseous fuels—production; nuclear electricity net generation\*, conventional hydroelectricity\* (not hydro pumped storage), geothermal electricity\*, solar thermal and photovoltaic electricity\*, wind electricity\*, wood and wood-derived fuels consumption; biomass waste consumption and biofuels feedstock.

#### Violation—R&D isn’t tied to electricity production—plan is at best an indirect incentive.

EIA, 1992. Energy Information Administration, Office of Energy Markets and End Use, U.S. DOE. “Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets,” ftp://tonto.eia.doe.gov/service/emeu9202.pdf.

Research and development. The budgetary cost of Government-funded research and development (R&D) is easy to measure. Determining the extent to which Government energy R&D is a subsidy is more problematic: often it takes the form of a direct payment to producers or consumers, but the payment is not tied to the production or consumption of energy in the present. If successful, Federal-applied R&D will affect future energy prices and costs, and so could be considered an indirect subsidy.

#### Vote negative—

#### 1. Limits—almost any government action can indirectly impact energy markets—only direct financial disbursements for production provide a stable topic.

#### 2. Ground—they can avoid core production DAs like natural gas or electricity prices—indirect R&D allows affs to be constructed around research spin-offs while spiking out of core generics.

### 3

#### Nuclear power discourse encourages faith in progress while sacrificing vulnerable populations to state interests.

Welsh 2k—Ian Welsh, Sociology @ Cardiff [*Mobilising Modernity* p. 3-9]

I argue here that the implementation of nuclear power recasts state citizen relations, weakening the automatic association between state and citizen welfare. The pursuit of interstate ambitions demanded the sacrifice of private citizens. Democratic states injected plutonium into vulnerable social groups and deliberately exposed civilian populations to radioactive fallout and discharges. The issues confronted here are hardly of less importance at the start of the twenty-first century where they have become writ large within a wider environmental agenda. Third, there is a widespread assumption that the nuclear case is somehow a relic from a bygone age dominated by state-sponsored corporatist 'Big' science. Whilst the wartime military origins of nuclear power appear unique, to assume that free-market ascendancy has banished the social, cultural and political forces influential in the premature launch of 'Big' science projects is a chimera. Despite the massive dominance of private capital in the world system, nation states and coalitions of nation states continue to play a pivotal role in shaping scientific and technological trajectories. They seed-fund new technologies and shape their subsequent development through regulatory interventions in an increasingly global sphere which requires instruments of global governance (Welsh 1996, 1999). Despite this, large corporatist science reliant on state sector finance continues to colonise futures on society's behalf but largely without societal knowledge. The scale of these projects is now so immense that nothingless than global collaboration between the most prosperous economies in the world is required. I Just as the joint stock company transformed the face of capitalism in the nineteenth century, global research and development are transforming the productive and communication bases of the new century. The quantitative changes brought about by these efforts will result in immense qualitative social transformations which we cannot envisage. The science and technology of these productive bases are under development now; Freud's bridge to the future has been replaced by technology already. Rather than speculate about what is around the corner, as both post-modernists and reflexive modernisers do, is it not worth identifying those trails which disappear beyond the omega point that is the future now, and ask certain questions of them? How and by whom were these trails first conceived? How were these particular trails blazed? Why were other trails ignored and not pursued? Who did the trailblazing? Why were people willing or unwilling to follow? The nuclear and space ages were born together in the aftermath of World War II. It is my argument that many of the key sociological insights needed to navigate in relation to the 'new' technologies can be derived from studying the sets of relations established in this era. Fourth, we remain relatively uninformed about the kinds of strategies which propel certain technologies to the forefront of scientific R&D (Research and Development) agendas. It would be naive in the extreme to assume that there are simply technological winners which stand out clearly from the throng of competitors. Amongst other things this would require the absolute demonstration of the superiority of the scientific knowledge and engineering feasibility of particular projects over others. Closure and ascendancy are never the product of absolute knowledge. The ascendancy of scientific discoveries are crucially dependent upon the articulation of a wide range of discursive claims around them. Perhaps controversially I will show how eminent scientists playa key role in such claims-making. In this connection it is crucially important to pay attention to the particular discourses which are constructed around particular technologies. The extent to which a technological narrative articulates sympathetically with other ascendant discourses plays a crucial role in determining its success in gaining funding - whether state or private. If we are to begin these processes sociologists need to abandon the practice of addressing 'science' as if it was a unified set of institutions, practices and techniques. To accept science uncritically in this manner is to fail to unmask the ideological success of the sciences in projecting the image of a unified field called science which produces knowledge which is objective and more reliable than other knowledge forms. One way of achieving this is to develop Yearley's argument that science can be seen as a social movement seeking to harness public opinion behind a Utopian vision of progress driven by an uncomplicated scientific rationality (Yearley 1988: 2). As an approach towards the struggle for social andpolitical acceptance of the overall superiority of scientific method against other forms of knowledge and rationality this conception has undoubted value. It remains questionable, however, whether science can be regarded as such a collective enterprise. It would seem more accurate to approach science as an arena within which many sciences challenge and compete for privileged status. Viewed from this perspective nuclear science constitutes a particular scientific social movement seeking to transform society through the acceptance of particular sets of knowledge claims and acceptance of the associated social and technical practices. Nuclear power can thus be regarded as the bearer of a particular scientific social movement's view of the desirable or good society. As Dant notes, from this perspective, practitioners' statements 'are framed, within particular contexts, to represent the beliefs of the speaker as true knowledge' (1991: 153). By approaching nuclear science as a particular scientific social movement, harnessing the dominant cultural codes of a society to its particular knowledge claims, two objectives are achieved. First, we are reminded that this was but one scientific social movement amongst many. Second, it becomes possible to move beyond Yearley's conception of scientific social movement as a form of interest representation to embrace wider social, ethical and moral concerns. By recognising the existence of a plurality of scientific social movements, each prioritising discrete bodies of knowledge and techniques, one moves away from the idea of a unified body called science. As both McKechnie (1996) and Melucci (1992) comment this has the effect of rendering scientific knowledge as bricolage, a combination of cues, the meanings of which are dependent upon the social context of the observer. This has the effect of de-prioritising the foundationalist claims to superior knowledge which underpin many of the strands of legitimation surrounding the nuclear issue and prioritising the social contexts within which competing knowledge claims are read off (Knorr-Cetina and Mulkay 1983). The ascendancy of a particular science thus becomes a question of the degree of congruence between its knowledge claims and the social and ethical aspirations and priorities prevailing within a social formation. Being in tune with the prevailing Zeitgeist is a significant, though not sufficient, factor in enabling certain sciences and not others to become established as seemingly unstoppable industrial concerns. Scientific social movements compete with each other for resources, status and the achievement of particular visions of desired futures. The nuclear case provides an immensely rich basis through which to analyse empirically the kinds of discursive strategies deployed by a particular movement. It is my argument here that there are patterns and repetitions, a genealogy of symbolic forms, across time which offer a particularly powerful means of sociological engagement with science policy and science implementation. By identifying the repetition of key discursive interventions over time it becomes possible to demonstrate how past interventions are important instructuring contemporary public - science relations in terms of institutionally defined issues of trust and risk; the credibility of scientific projects for public funding; and the role of science and scientists within wider culture. I identify six key discourses involved in these processes, namely: Freezing time by claiming the future. Locating the future on a 'new' frontier. Asserting superior knowledge claims. Asserting imperatives. Discounting residual difficulties into the future. Asserting faith in progress. Before proceeding it is necessary to outline the kind of discursive work associated with each of these forms of discourse. Freezing time by claiming the future Big science projects such as the atomic science movement typically have very long lead times which almost inevitably involve considerable areas of uncertainty. Discursive claims emphasising the future thus assume considerable importance to the extent that they direct attention towards distant time horizons and away from more immediate time frames inhabited by scientific and technological uncertainty. The future invoked within such discourse typically emphasises positive collective outcomes for 'mankind' in the face of current uncertainties and doubts. Locating the future on a new frontier The evocation of the future also suggests other registers suggestive of progress and change. Within modernity human progress has been powerfully associated with moving towards and expanding the frontiers of civilisation. This is both a spatial and conceptual process where opening new frontiers can be both geographical and knowledge-related. The discursive relevance of frontier-speak includes the evocation of the contingent. Frontiers are by definition risky places where only the brave and the intrepid venture. Frontiers are risky because the comfortable modernist illusion of control, order, dominance and rationality is clearly not operating. Frontiers have been predominantly male zones. In the case of major scientific innovations a number of futures are evoked. Frontier claims are made on epistemological grounds - innovations are at the frontiers of human knowledge and scientific endeavour. Discourses of the frontier thus evoke the sense of risk-taking associated with brave pioneers and explorers who have gone to the margins (see Shields 1991). Paradoxically there is a simultaneous translation of risk into certainty through the invocation of new economic frontiers leading to newly won or re-established economic prosperity. New frontier, new era, new bright confident future, goes the constellation. The discourse of frontier-speak thus at one and the same time acknowledges scientific and epistemological lack whilst subordinating knowledge deficits to a future in which they have been resolved. Asserting superior knowledge claims Claims to superior knowledge represent an important discourse in the advance of all scientific social movement's projects. In terms of the atomic science movement the cultural capital and prominence enjoyed by physics in the aftermath of the successful testing and use of the atomic bomb represented a considerable resource. The overall success of the discipline in the face of seemingly insurmountable odds leant credence to practitioners' claims that apparently insurmountable knowledge deficits would be overcome on the basis of past successes. The assertion of superior knowledge relating to an envisaged future is thus based on past outcomes. One important implication here is that innovations arising from 'new' sciences and/or cultural backwaters have no such repertoire of past successes to draw upon in legitimating their future claims. In this sense symbolic capital assumes a position of considerable importance. Asserting intperatives The assertion that there is no alternative (TINA) represents one of the most fundamental discourses in the advancement of the atomic science movement and can be seen in relation to both nuclear fission and nuclear fusion. 2 The TINA can be regarded as a kind of discursive trump card capable of dismissing any counter-argument and is often closely associated with the use of 'crises' of various kinds to underline the need for a particular technique. The pervasive use of the notion of an energy crisis is a recurrent 'discourse coalition' (Eder 1996) used in association with a nuclear TINA throughout peak modernity. Discounting residual difficulties into the future Scientific or technical difficulties which become acknowledged within a particular present can become problematic to the advance of a scientific social movement's agenda. A typical response is to discount such difficulties on the basis that they will be readily overcome in the future. There are at least two distinct senses in which this displacement into the future operates: problems of basic physics form one category and problems of engineering design, materials science and operational procedure constitute another. It is important to remember that the resolution of problems of basic physics can often be the beginning of operational and engineering difficulties which prove even more intractable and contested. The nearer basic research gets to operational configurations the greater the likelihood of scientific and technological consensus weakening in the face of competing claims made on the behalf of rival systems - something which certainly characterised thermal reactor designs in the 1950s, 1960s and 1970s (see Ch. 5 and Welsh 1994). Asserting faith in progress Within modernity scientific and technical progress assume such an axiomatic position that it becomes almost impossible to question progress without the automatic application of the label Luddite. Such faith is frequently invoked by senior figures within the atomic science movement in order to overcome reservations over economic cost, technical and scientific viability and so on. In a paradoxical manner appeals for progress through science and technology - the application of rationality - lead to calls for the suspension of rational and economic doubt on the basis of 'faith'. Ironically such appeals are typically made within the confines of specific scientific social movements. Here, for example, is Sir John Hill, chairman of the United Kingdom Atomic Energy Authority, delivering a lecture entitled 'Nuclear Power in the United Kingdom' in 1971 within which he included the prospects for nuclear fusion: I hope we will not lose all sense of striving for the future or of interest in the undiscovered, nor refuse to make any journey unless every step can be counted and measured in advance. The road to successful and economic fusion power stations is uncharted. I hope we can maintain our resolve to continue the exploration. (Hill 1971: 238) The metaphorical articulation of spatial adventuring - journeying, risk and uncertainty coupled to the prospect of future benefits are all present in this one short extract. Subsequent chapters will trace the origins, development and transformation of the founding discourses of the nuclear moment from the bright new dawn of the 1950s through to the apparently perpetual twilight which typifies the nuclear domain at the turn of the century. At the centre of this assemblage of discourses lies the task of dealing with uncertainty and contingency both within science and in the wider social and cultural spheres which support science as a set of material practices.3 Within science, contingency and uncertainty are inescapable as either conjecture and refutation (Popper 1963), or substantive paradigm shifts (Kuhn 1962) continually leave the corpus of scientific knowledge subject to revision or complete reformulation. The claims for a science at one time point on the basis of an accepted, or at least defensible, body of knowledge are contingent and subject to change within the institutions of science. In the public sphere such revisionist change oftenoccurs after a particular trajectory of technological development is well advanced. One consequence of this is that the resultant changes in scientific claims-making can be read as inconsistency or failure to live up to previous promises. In terms of public acceptance and trust the malleability of scientific claims-making assumes a position of even greater importance when information technologies facilitate the retrieval of past statements into new time frames.4 One obvious way to avoid such deficits in public trust would be to abandon making certain kinds of claims. This, however, assumes that such claims have no other role in the fortunes of particular big science projects, for example, securing funding and political support. At the level of socio-cultural formations ceasing to make such claims would also fundamentally reduce the symbolic potency of science as the bridge to the future.5 Historically it is the discursive claim to 'futurity' above all others which has been central to the institutional consolidation of science within western civilisation.

#### Nuclear power aligns society and science with the ideal of necessity. The aff’s vision makes politics, reason, and science into weapons of collective mass destruction.

Wynne 11—Brian Wynne Science Studies and Research Director of the Centre for the Study of Environmental Change @ Lancaster (UK) [*Rationality and Ritual* 2nd Edition p. 22-23]

As I only indicated in passing in this book originally, much post-war discourse demonstrates how nuclear technology was quintessentially the secular religious front of post-war science and technology (Noble, 1997; Weart, 1988; Szerszynski, 2005; Gilkey, 1981; Winner, 1977; Wynne, 1987). As I explained in the final chapter, the hubris which I argue was prime origin for the politics of public mistrust of such ambitious institutional programmes also embodies profound insecurities on the part of its hubristic subject-agents. Nuclear technology had carried with it from the very start the sense of being a suprahuman force of historical destiny - something awesome from beyond the agency of mere humans. Nuclear technology's apocalyptic bomb origins projected this 'old testament style' belief in its perverse power to create eternal peace. Crucially however, this was not imagined to be through peaceful human negotiation and reconciliation of human difference. It was through threat of mind-numbing physical violence and technological terror over others who were assumed to be intrinsically lethally threatening, thus requiring control by unambiguously genocidal counter-threat. A similar if far more deeply buried sense of insecurity prevails with respect to the publics that those institutional powers cultivate, and supposedly represent. The deterrent imaginary of what we might now call (more than quizzically, I would hope) supposedly 'public good science',25 Weart (1988) resoundingly demonstrates, was invested implicitly but fervently in ·nuclear science and technology. Of course, this actual definition of public good science enjoyed no kind of informed democratic debate, accountability nor sceptical reflection about what might be the proper human ends of knowledge and technical power. No human hand was recognized to be at work in shaping them; just the force of history and necessity - benign or not (Winner, 1977). Although the cold-war's dissolution has on the face of things rendered obsolete the monolithic mutually assured destruction imaginary of threat and violent deterrence, these have far from disappeared, but have instead condensed on to the new more insidious and dispersed imagined threat of global terror, even from 'within'. As it was expressed in The New York Review of Books (Taylor, 2006), we live in an age where 'reason seems to have lost its way, and violence threatens to spin out of control'. Yet the more that the familiar sense of incipient disorder looms, the more we seem doomed fearfully to mistake the anxious functional reductionisms of science and instrumental rationality for ultimate truth and moral order.26 How can we possibly refer seriously to 'reason' or 'science' in the unqualified and singular way we witness in everyday public spheres, while seeing it invested with so much unstated moral fervour? While rituals of public rationality may be functionally generative, even essential in some respects, this does not mean that the ones which we live are of an appropriate, or even viable, cultural or political form. I hope this book can still make a modest contribution to a much larger project even than that of rendering nuclear technology honest, whatever that means for its future development or demise. This is the relentless project - a modestly unapologetic enlightenment one - of disentangling the deep and socially debilitating confusion and denial which pervades modern science as public knowledge and culture.

#### We should backcast from sustainability instead of forecasting nuclear inevitability. Backcasting establishes sustainability goals and targets long-term social relationships instead of short-term projection of nuclear development.

Welsh 2k—Ian Welsh, Sociology @ Cardiff [*Mobilising Modernity* p. 220-223]

Future risks and backcasting The notion of back casting has been established within the business community for some time and has been harnessed by firms such as IKEA towards the realisation of environmentally sustainable trading. It is a technique which has much potential within a wider frame given the necessary political will and inclusionary forethought. A backcast is basically a means of arriving at a future desired state which does not involve forecasting i.e. projecting past and or present trends. The whole notion of progress within modernity has been closely aligned with forecasting and indeed liberal futurology embraces such forecasting. In the hands of liberal futurologists not only are past patterns and rates of material well-being projected into a future they are also spatially expanded to include all peoples (Khan 1977). The nuclear science social movement represented a particular expression of hard technocratic futurology which projected past trends in energy demand forwards arguing that only nuclear power could fulfill this need and avoid an energy crisis. Since the 1950s peak modernity forecasting has reinforced a tendency towards monolithic, universal solutions to perceived problems. In terms of the themes addressed here, the total dominance of domestic electricity supply by nuclear power necessary to ensure a domestic reactor market capable of sustaining exports is a prominent example of this tendency. Backcasting establishes a set of criteria representing an ideal outcome and a time frame within which these are to be realised. In a business context the objective may be a 100 per cent sustainable supply base. Once the objective is agreed then a backcast sets targets working back towards the present. Each target then represents a measure of progress towards the ideal outcome. Such milestones permit periodic reappraisal of progress, refinement of future targets, or ultimately the negotiation of a different ideal end point. Business advocates thus emphasise the flexibility and negotiability of backcasting compared to forecasting. It is my argument here that applied to the sphere of science policy backcasting has the potential to introduce significant social inputs in stark contrast to modernist techniques associated with 'blind' progress by technocratic decisional forums. In short what I am proposing is a shaping of science policy towards declared societal goals. As we have seen scientists have responded positively when set clearly defined targets by political and military elites. By framing the characteristics of scientific and technical developments through a conscious process of social consultation a guide to desired technical futures would represent a transition from weak cultural framing to strong cultural framing for the scientific enterprise. Compared to the courting of public support after the scientific fact this approach would begin to direct science towards the kinds of facts a society is interested in. Since the beginning of the nuclear moment the atomic science movement made a series of discursive claims centred on securing a better future for 'the people'. Contemporary science continues to make similar discursive claims (Welsh 1999) in the context of a market dominated milieu where techniques targeted at individual rather than collective goals are 'naturally' ascendant. Corporatist planning is in effect displaced by corporate pursuit of market dominance and secure profit margins through the implementation of new techniques. Whilst the 'magic' of these new techniques is not to be underestimated their introduction within capitalist social and economic relations reproduces and intensifies old economic inequalities whilst introducing new dimensions of social stratification based on access to the new techniques. 13 Against this background the definitional task of defining the target of a science policy backcast should be social, political and cultural, focusing on the patterns of social activity and relations in a desired society. The aims of science policy can then be orchestrated around the task of enabling the achievement of societal goals. Such a backcast would be an ambitious undertaking being necessarily wide-ranging in scope. Certain central themes suggest themselves as vital and include the organisation of work, leisure, communications, travel, access to countryside, parenting and so on. Such an agenda has a political component requiring the negotiation of a new global settlement with capital which is clearly beyond the scope of this book. Elements of this settlement are, however, central to my present case. In terms of risk production timescales assume a pivotal role (Adam 1998). The appropriation of the future with apparent certainty has been one of the key discursive means through which science has been mobilised around specific technological trajectories within modernity to date. Against this Beck has argued for accepting uncertainty as a guiding principle within risk modernity and the loosely associated need to reduce the tempo of scientific and technical innovation. Whilst recognising that the future is always contingent, placing an uncertainty principle at the heart of the institutions of a new modernity potentially threatens the morale and mindset necessary for 'progress' and carries with it an unviable tendency towards stasis. A science policy backcast would be one way of redressing this by identifying a set of socially defined targets open to change and realignment rather than sciences setting out to colonise the future on society's behalf society would direct science towards a desired future to colonise, one in which a significant degree of public choice was invested. The recognition that a science policy backcast extended beyond the term of office of any democratically elected administration would help overcome some of the major shortcomings which have typified the relationship between the political and scientific spheres throughout the nuclear moment. Central here lies the issue of democratic deficit associated with scientific and technical decisions taken behind politically closed doors with binding consequences extending far beyond the period of elected office. The apparently unstoppable nature of this juggernaut owes much to the way in which elected parties inherit complex scientific and technological developments set in train perhaps decades earlier and for which the incumbents assume responsibility. 14 A science policy backcast would help separate this crucial sphere of modern life from this damaging deficit which plays a major role in issues of public acceptability of science whilst simultaneously avoiding the short termism of national electoral politics which has major implications for scientific R&D. A science policy backcast would not undermine party-political difference or the competition for electoral success as national politics would be framed by parties' proposals to achieve stages of the backcast. Within the context of a science policy backcast Beck's arguments for reducing the pace of technical innovation would become more readily implementable. Whilst contemporary capitalist competition ensures that R&D cycles are kept as short as possible, so that profit flows can begin to recoup costs as soon as possible, alignment to a long-term backcast would represent an economic incentive towards long-termism. Given a societal commitment to the characteristics of the desired future companies would enjoy a heightened degree of security in terms of their product development work. An awareness of the social goals prioritised by populations would become an incentive for companies to contribute towards backcast targets. Inter-company competition to improve movement towards backcast targets would become a surrogate for blind market forces and drive the process of innovation. Applying a politically binding backcast to science policy may appear an insurmountable task. Elements of the process are in effect being introduced in a range of decisional forums already, however. Attempts to control human contributions to greenhouse gas emissions could be seen as a form of backcasting confined to the reduction of particular greenhouse agents working back from targets located in the future. The complexity of this task and the potential for sectional lobbies to advance instrumental interests over and above the pursuit of collective interests underlines both the potential and limitations of the approach on a wider stage. The Labour government elected in 1997 has embarked upon innovatory and inclusionary measures relevant to this domain, perhaps most notably the creation of a children's parliament with direct access to Deputy Prime Minister John Prescott. An initial task of this group was to debate and outline the kind of environment they most wanted to have as young adults. In essence this is an element of a backcast. A conscious focus on backcasting as an approach applicable across the entire gamut of government activity would provide the basis for a proactive approach towards delivering a socially negotiated future. More specifically, a collectively negotiated scientific R&D agenda aimed as the maximisation of clearly defined social preferences and relationships may increase the time to market but it may also minimise the risk of rejection suffered by innovations where the public is only consulted after the fact. 15 A socially negotiated science policy would not preclude an element of curiosity research which has historically typified the scientific enterprise but it would provide a very different framework for the application of techniques. In terms of science- society relationships the nuclear moment has revealed the limitations of remote, expert dominated decisional forums where the pursuit of rationality can become irrational. The nuclear enterprise's belief in operational safety assumes perfect rationality in the workplace leading to perfect compliance with often complex and inconvenient practices. This irrationality is obvious to members of the public who know that people come to work drunk, distraught, bend working practices to win bets with their mates, flout safety rules in displays of masculine bravado and so on. In the face of this common sense wisdom the assumption of perfect rationality is blatantly irrational. In workplaces where such actions have limited consequences they may be socially acceptable but in high consequence, low probability-risk occupations public acceptability has a much lower threshold. I have argued here that contemporary theories of reflexive modernisation neglect the need of institutional reform and realignment necessary to reconfigure modernity in relation to both past and future risks. In terms of the present there is also a need to collapse the distance between margins and centres. One of the consequences of modernity has been the irreducible conflict between situated local knowledges, desires and aspirations and abstract universal knowledge claims. The abstract risks associated with techniques such as cost-benefit analysis are rendered concrete in local contexts producing perspectives which prioritise the pursuit of different forms of knowledge which can fall between the remits of official institutions. The pursuit of knowledge by engaged citizens can thus highlight significant gaps in the distribution of institutional effort directed towards knowledge acquisition. In terms of the present this disparity highlights the importance of considering ways of enhancing the role of citizen surveillance and regulation in relation to industries where risk vectors may be invisible but the impacts are discernible, even in apparently inchoate ways, to situated publics. Far more important however is the need to recognise that inclusionary methods of negotiated forward trajectories represent an underdeveloped approach towards science policy. The limitations of the established model are already widely dispersed, as revealed in research into the so called 'new genetics' (Kerr et al. 1998).

### 4

#### Immigration will pass.

CT POST 3/28/13 Connecticut Post http://www.ctpost.com/local/article/Immigration-reform-gaining-support-in-Congress-4393187.php

A Republican Party in desperate search for relevance to Latino voters. An expanded Democratic advantage in the Senate. A second-term President with his legacy on the line.

Does all that add up to enough to break decades of impasse and produce comprehensive immigration reform? As expectations -- and tensions -- rise, the answer won't be long in coming.

A bipartisan bill could be filed in the Senate as early as next week, followed in relatively short order by a House bill, also crafted by a bipartisan group, aiming at a compromise on the key issue of citizenship.

The efforts are being applauded by President Barack Obama, who is using every ounce of his political clout to try to get comprehensive reform.

Obama said the time has come "to work up the political courage to do what's required to be done."

"I expect a bill to be put forward. I expect a debate to begin next month. I want to sign that bill into law as soon as possible," Obama said at a White House naturalization ceremony.

In addition to the issue of eventual citizenship for 11 million undocumented immigrants, Congress is expected to address the need for temporary or guest worker programs.

Congress last passed comprehensive bipartisan reform legislation in 1986, when President Ronald Reagan signed a law that granted citizenship to several million undocumented immigrants and created a guest worker program.

Up until now, Republicans have opposed citizenship programs as an "amnesty" for lawbreakers who entered the country illegally, and labor has chafed at guest worker programs.

But Republican losses in the 2012 elections and increased public support for reform have many in the GOP talking compromise.

"If there is one issue that the two parties could produce something meaningful on in this Congress, it would be immigration," said Stephen Hess, a political expert at The Brookings Institution.

Hess said an eventual bill "will have lots of provisos, and it will go back and forth, but it would be hard not to produce something given the general feeling that something has to be produced."

More and more Republicans are moving toward immigration-reform measures as the party seeks to reach out to Latinos, the nation's largest -- and growing -- minority voting bloc.

Public opinion is behind them.

A recent poll showed 63 percent of Americans supported a path to citizenship for undocumented workers provided they meet certain requirements, according to a survey by the Public Religion Research Institute.

Notable Republicans who have recently spoken in favor of compromise on citizenship proposals include Sen. Rand Paul, R-Ky.; former Mississippi Gov. Haley Barbour; and Rep. Paul Ryan, R-Wis.

And a March report by the National Republican Committee, considered a "post mortem" on the 2012 elections, recommended the GOP embrace comprehensive immigration reform to shore up its shaky standing with minorities -- Latinos, in particular.

Roy Beck, executive director of Numbers USA, which advocates lower numerical numbers on immigration, predicted a majority of Republican senators would oppose citizenship.

Groups like Numbers USA are working to hold GOP senators in line. They sent 13,000 emails to Kentucky voters that claimed Paul's position was "more radical and pro-immigration than anything proposed by President Obama."

The group has targeted Sen. Lindsey Graham, R-S.C., one of the "Gang of Eight" senators writing the Senate bipartisan bill, as a lawmaker who favors foreign workers over unemployed South Carolinians.

Democrats from conservative-leaning states could also feel political heat.

Beck said if five to 10 Democrats in the Senate oppose a bill, proponents would need 10 to 15 Republicans to reach the 60 votes needed to cut off debate and vote on legislation.

"You do the math," Beck said.

In 2007, an effort to cut off debate on a Senate immigration reform bill died on a 46-53 vote.

But immigrant reform proponents, such as America's Voice, say there is a "tectonic shift" in the GOP, and the Democrats also have expanded their Senate majority to 53-45, plus two independents who caucus with them. They predict the Senate will muster the votes necessary to pass a reform bill.

Still, it won't be easy.

"We will have not only a few potholes, but a few near-death experiences along the way," said Frank Sharry, America's Voice executive director.

#### Basic research is bipartisan, but government funding of applied energy research causes backlash.

Washington Post, 6/4/2012. “Republicans want to take the ‘D’ out of government ‘R&D’,” http://www.washingtonpost.com/blogs/wonkblog/post/republicans-want-to-take-the-d-out-of-government-randd/2012/06/04/gJQAmOJ7DV\_blog.html.

By and large, both parties have been able to agree on that much: Congress has largely spared basic research and development from the chopping block during recent budgets; both houses are even pushing for more funding for agencies such as the National Science Foundation in 2013.

But there are cracks emerging in that bipartisan consensus: House Republicans are becoming increasingly wary of funding energy innovation that support the second half of “R&D”--the development necessary to transform scientific research into technological innovation that ultimately would be used and commercialized outside of the lab. Earlier this spring, the House Appropriations Energy and Water Subcommittee passed a bill for 2013 that would cut funding for energy R&D by 27 percent.

Created in 2007 under the America Competes Act with strong bipartisan support, the Advanced Research Projects Agency-Energy, or ARPA-E, is modeled on the Pentagon’s highly successful DARPA program to help bridge the gap between research findings and the technological prototypes that could apply such breakthroughs to the real world. It’s a phase in innovation known as the “Valley of Death”: the financing gap that can doom promising new technologies before they have a chance.

Venture capital and angel investors from the private sector can and do step in. But policymakers for both parties have agreed that the federal government is particularly well suited to fund “high risk, high reward” ideas through ARPA-E--a mission that implicitly acknowledges that failure is naturally part of the process.

ARPA-E’s early investments—ranging from high-powered lithium batteries to low-cost solar panels—have garnered praise from both sides, prompting calls to increase funding. The American Enterprise Institute, Brookings, and the Breakthrough Institute proposed a $1.5 billion annual budget for the agency in a 2010 report. Even the Heritage Foundation suggested a $300 million budget for ARPA-E in 2012, in the same plan in which it proposed to dismantle the entire Department of Energy.

Senate Republicans have similarly risen to ARPA-E’s defense in the face of proposed cuts. “We are now going to have to cut back somewhere… But we want to cut fat, not muscle and bone,” Sen. Lamar Alexander (R-Tenn.) wrote in April 2011. “It is my belief that the work done by ARPA-E and the private-sector innovators will lead us into a world of improved, clean, reliable low-cost energy.”

But after an initial boost of stimulus funding in 2009--which helped tide the agency over into 2010--Congress has significantly pared back funding, and House Republicans want to push it down even further, proposing to cut the $275 million budget in 2012 to $200 million:

Why have House Republicans soured on the program? **Many believe the government should only focus on basic scientific research and get out of the “development” phase altogether**. Last year, Rep. James Sensenbrenner (R-Wis.) criticized ARPA-E for focusing on “on later-stage technology development and commercialization efforts” for energy innovations. “I do not believe that the government ought to be in the business of picking winners and losers,” he told the New York Times. A House subcommittee also found that firms that received government loans also received private investment, which Republicans saw as proof of government waste.

It’s the same rationale that Republicans have used in recanting their support for clean-energy loan programs in their attack on Solyndra. Such government loans are aimed at helping new technologies overcome the second “Valley of Death” from prototype to full-scale commercialization.

Republican presidential candidate Mitt Romney, for example, supported such loans when he was governor of Massachusetts, personally delivering a $1.5 million check in 2003 to Konarka, a solar panel company that just went bankrupt. But on the campaign trail, he has attacked the $535 million Solyndra loan as “crony capitalism” that gambled with taxpayers’ money to enrich Obama’s allies. By contrast, he has shared Obama’s call for more government spending on basic scientific research.

In both cases — the attacks on Solyndra and the House ARPA-E budget-cutting — Republicans essentially want to narrow the role of government. **Basic research is still kosher. But aggressive government forays into development should be discouraged**.

#### PC key.

The Atlantic 2/21/13 [There's Reason to Be Optimistic About Congress—Seriously, http://www.theatlantic.com/politics/archive/2013/02/theres-reason-to-be-optimistic-about-congress-seriously/273393/]

Nevertheless, this is a new congressional session, and Boren's pessimism might possibly be proved wrong. For the first time in a decade, if not longer, conditions are aligned for bipartisan deal-making, raising hopes that Congress might actually do something and satisfy the wishes of millions of Americans hungry for action. "I am pleased with the signs I see in Congress today to try to make deals," said Lee Hamilton, who was a veteran Democratic House member from Indiana. "There are threads of it -- it's not a fabric yet -- but there are threads, and that's encouraging."

In today's context, defining success is important -- and requires a healthy dose of both skepticism and pragmatism. There's little hope that this Congress can reverse the -- exacerbated by, among other things, powerful special interests and partisan media -- that has gripped Washington. The forces that drove Rep. Boren out of Congress remain potent, and the legislative atmosphere on Capitol Hill is still toxic.

Instead of a long-term course correction, the question is whether Republican leaders in the House, President Obama, and Senate Democrats can facilitate a reprieve -- if only to show the public that the institution is still functional. Cutting a deal with the broad backing of both parties isn't a question so much of relieving those pressures as of learning to pass laws in spite of them.

Favorable Conditions

The makeup of the 113th Congress and the occupant of the White House make conditions riper for bipartisan legislation than at any time since President George W. Bush's first years in office. Since then, Washington has been in the grip of one of two dynamics: Either one party has held Congress and the presidency, or one party, possessing limited power, has had little interest in passing consequential legislation.

The latter was the case last session, when Republicans controlled only the House. In most cases, they used this chamber to approve legislation, such as Rep. Paul Ryan's eponymous budget, that helped define the party's agenda but had no chance of gaining approval in the Senate (much less withstanding a veto from the White House). They were trying to wait out a president whom they believed would be sent packing in 2013.

Democrats were in a similar position from 2007 to 2009, when they controlled Congress but wanted to wait out Bush's tenure. The lack of bipartisanship, of course, didn't prevent major legislation from becoming law over the past 10 years. But when Democrats controlled Washington and passed the Affordable Care Act in 2010, or similarly empowered Republicans approved Medicare Part D in 2003, they didn't need the backing of the other party -- and by and large didn't get it.

This session is different. Neither party has unilateral control, and yet there is an appetite, in the first year of Obama's second term, to make a serious attempt to legislate. The last time Capitol Hill saw something similar came in 2001 and 2002. Republicans suddenly lost the Senate when Sen. Jim Jeffords of Vermont defected from the GOP in the early summer, but Congress still overwhelmingly approved the No Child Left Behind Act months later (although the first round of Bush's tax cuts passed with only a dozen or so Democrats on board in each chamber). Later, the parties worked together to approve a slew of national security issues after the Sept. 11 terrorist attacks.

But drawing comparisons to that period is difficult because of 9/11; and, besides, most of Bush's term is hardly associated with bipartisan comity. The better parallel -- and the experience current optimists point to -- is 1996 and 1997, which bridges the end of President Clinton's first term and the beginning of his second. That two-year span saw agreements on a series of important issues, ranging from two big-ticket items (welfare reform and a balanced-budget agreement) to lesser-known achievements (such as raising the minimum wage).

The similarity between that period and now extends beyond the split control of government. Only a year earlier, Republicans had ridden the "revolution" of 1994 into control of Congress, when they promised to push their agenda whether Clinton approved or not. But the party ultimately dealt with political setbacks, none more damaging than the government shutdown of 1996. The public blamed Republicans, and afterward Clinton never again trailed GOP presidential nominee Bob Dole (who was Senate majority leader at the time of the shutdown) in a head-to-head matchup, according to preelection polls.

Boehner's Challenge

Public opinion might once again be pulling against Republicans, burnt as they were by Obama's reelection and their unexpected losses in the Senate. In a January poll by The Wall Street Journal and NBC News, 49 percent of adults disapproved of the GOP -- and only 26 percent approved. It was the worst rating for Republicans since 2008. Just as the Republicans in Clinton's time decided their political survival depended on coming to the table, the GOP of today might do the same. "Republicans overplayed the government shutdown, and President Clinton won that battle," said Dan Glickman, a former House member who was Clinton's Agriculture secretary. "And, with that, he effectively used the bully pulpit to control the agenda. He gave a lot of cover for people to vote for him. It's not the only factor, but members of Congress are much [more] likely to support a president when the people at home are inclined to support the president."

How much Obama's broad popularity matters to most GOP House members is debatable. With many of the president's supporters packed into heavily Democratic urban districts, most Republicans represent safely red districts. (In November, Mitt Romney won 227 congressional districts, a majority, despite losing by 4 percentage points in the national vote.)

But Obama's standing could weigh more heavily on House Speaker John Boehner and Majority Leader Eric Cantor than on their followers; Cantor has recently attempted to rebrand the party with a softer image. While their charges' interests are more parochial, they have the national party's image to worry about. Popular opinion could prod the two leaders to reach agreements with Obama, especially on emotional issues such as gun control and immigration. Or, at the very least, public pressure could work to ease the disagreements that make even basic government action difficult -- a factor that might have been at work when House Republicans engineered a three-month delay of the debt ceiling. "They're hearing the message outside the Beltway that 'we elected you people to make things work,'" said John Breaux, the former longtime Democratic senator from Louisiana.

The onus falls particularly hard on Boehner, whose struggles to control his conference are well documented. More than any other player in Washington, he will determine whether anything gets done this year. How he decides to proceed could rest on how frequently he's willing to leave conservative colleagues out in the cold and, consequently, how far he's willing to risk his speakership.

The good of the party, and not his seat of power, propelled Boehner's decision to bring the superstorm Sandy relief bill to a vote earlier this year, when it passed with just a minority of support from Republicans. That combination -- Democrats and the moderate wing of the House GOP -- is the pathway to enacting a sweeping set of bipartisan agreements.

A week after the storm vote, a large bipartisan majority passed a three-month extension of the debt ceiling. "It is hard to see this Congress being viewed as a bipartisan one, but we have seen a glimmer of light on the recent bipartisan vote to extend the debt ceiling," said Ron Bonjean, a onetime aide to the Republican leadership.

Obama's Duty

Maintaining that momentum in the House won't be easy, and it could require Obama's personal leadership. Getting Boehner to take such a perilous route could depend in large part on successful cajoling from the president. And on this subject -- the relationships among Washington's top leaders -- discussion of a deal being cut becomes sharply pessimistic.

#### The impact is cyber terrorism.

Reuters, 6/13/2012. “Experts warn of shortage of U.S. cyber pros,” http://www.reuters.com/article/2012/06/13/us-media-tech-summit-symantec-idUSBRE85B1E220120613.

Leading cyber experts warned of a **shortage of talented computer security experts** in the United States, **making it difficult to protect corporate and government networks** at a time when attacks are on the rise.

Symantec Corp Chief Executive Enrique Salem told the Reuters Media and Technology Summit in New York that his company was working with the U.S. military, other government agencies and universities to help develop new programs to train security professionals.

"We don't have enough security professionals and that's a big issue. What I would tell you is it's going to be a bigger issue from a national security perspective than people realize," he said on Tuesday.

Jeff Moss, a prominent hacking expert who sits on the U.S. Department of Homeland Security Advisory Council, said that it was difficult to persuade talented people with technical skills to enter the field because it can be a thankless task.

"If you really look at security, it's like trying to prove a negative. If you do security well, nobody comes and says 'good job.' You only get called when things go wrong."

The warnings come at a time when the security industry is under fire for failing to detect increasingly sophisticated pieces of malicious [software](http://www.reuters.com/sectors/industries/overview?industryCode=174&lc=int_mb_1001) designed for financial fraud and espionage and failing to prevent the theft of valuable data.

Moss, who goes by the hacker name "Dark Tangent," said that he sees no end to the labor shortage.

"None of the projections look positive," said Moss, who serves as chief security officer for ICANN, a group that helps run some of the Internet's infrastructure. "The numbers I've seen look like shortages in the 20,000s to 40,000s for years to come."

Reuters last month reported that the National Security Agency was setting up a new cyber-ops program at select universities to expand U.S. cyber expertise needed for secret intelligence operations against computer networks of adversaries. The cyber-ops curriculum is geared to providing the basic education for jobs in intelligence, military and law enforcement.

The comments echo those of other technology industry executives who complain U.S. universities do not produce enough math and science graduates.

#### Nuclear war.

Sean Lawson, 5/13/2009. Dr. Sean Lawson is an assistant professor in the Department of Communication at the University of Utah. “Cross-Domain Response to Cyber Attacks and the Threat of Conflict Escalation,” Transformation Tracker, <http://seanlawson.rhetorical-devices.net/2009/05/13/477>.

At a time when it seems impossible to avoid the seemingly growing hysteria over the threat of cyber war,[1] network security expert Marcus Ranum delivered a refreshing talk recently, “The Problem with Cyber War,” that took a critical look at a number of the assumptions underlying contemporary cybersecurity discourse in the United States. He addressed one issue in partiuclar that I would like to riff on here, the issue of conflict escalation–i.e. the possibility that offensive use of cyber attacks could escalate to the use of physical force. As I will show, his concerns are entirely legitimate as current U.S. military cyber doctrine assumes the possibility of what I call “cross-domain responses” to cyberattacks. Backing Your Adversary (Mentally) into a Corner Based on the premise that completely blinding a potential adversary is a good indicator to that adversary that an attack is iminent, Ranum has argued that “The best thing that you could possibly do if you want to start World War III is launch a cyber attack. [...] When people talk about cyber war like it’s a practical thing, what they’re really doing is messing with the OK button for starting World War III. We need to get them to sit the f-k down and shut the f-k up.” [2] He is making a point similar to one that I have made in the past: Taking away an adversary’s ability to make rational decisions could backfire. [3] For example, Gregory Witol cautions that “attacking the decision makerÃ¢â‚â„¢s ability to perform rational calculations may cause more problems than it hopes to resolveÃ¢â‚Â¦ Removing the capacity for rational action may result in completely unforeseen consequences, including longer and bloodier battles than may otherwise have been.” [4] Ã¯Â»Â¿Cross-Domain Response So, from a theoretical standpoint, I think his concerns are well founded. But the current state of U.S. policy may be cause for even greater concern. It’s not just worrisome that a hypothetical blinding attack via cyberspace could send a signal of imminent attack and therefore trigger an irrational response from the adversary. What is also cause for concern is that current U.S. policy indicates that “kinetic attacks” (i.e. physical use of force) are seen as potentially legitimate responses to cyber attacks. Most worrisome is that current U.S. policy implies that a nuclear response is possible, something that policy makers have not denied in recent press reports. The reason, in part, is that the U.S. defense community has increasingly come to see cyberspace as a “domain of warfare” equivalent to air, land, sea, and space. The definition of cyberspace as its own domain of warfare helps in its own right to blur the online/offline, physical-space/cyberspace boundary. But thinking logically about the potential consequences of this framing leads to some disconcerting conclusions. If cyberspace is a domain of warfare, then it becomes possible to define “cyber attacks” (whatever those may be said to entail) as acts of war. But what happens if the U.S. is attacked in any of the other domains? It retaliates. But it usually does not respond only within the domain in which it was attacked. Rather, responses are typically “cross-domain responses”–i.e. a massive bombing on U.S. soil or vital U.S. interests abroad (e.g. think 9/11 or Pearl Harbor) might lead to air strikes against the attacker. Even more likely given a U.S. military “way of warfare” that emphasizes multidimensional, “joint” operations is a massive conventional (i.e. non-nuclear) response against the attacker in all domains (air, land, sea, space), simultaneously. The possibility of “kinetic action” in response to cyber attack, or as part of offensive U.S. cyber operations, is part of the current (2006) National Military Strategy for Cyberspace Operations [5]: Of course, the possibility that a cyber attack on the U.S. could lead to a U.S. nuclear reply constitutes possibly the ultimate in “cross-domain response.” And while this may seem far fetched, it has not been ruled out by U.S. defense policy makers and is, in fact, implied in current U.S. defense policy documents. From the National Military Strategy of the United States (2004): “The term WMD/E relates to a broad range of adversary capabilities that pose potentially devastating impacts. WMD/E includes chemical, biological, radiological, nuclear, and enhanced high explosive weapons as well as other, more asymmetrical ‘weapons’. They may rely more on disruptive impact than destructive kinetic effects. For example, cyber attacks on US commercial information systems or attacks against transportation networks may have a greater economic or psychological effect than a relatively small release of a lethal agent.” [6] The authors of a 2009 National Academies of Science report on cyberwarfare respond to this by saying, “Coupled with the declaratory policy on nuclear weapons described earlier, this statement implies that the United States will regard certain kinds of cyberattacks against the United States as being in the same category as nuclear, biological, and chemical weapons, and thus that a nuclear response to certain kinds of cyberattacks (namely, cyberattacks with devastating impacts) may be possible.

### 5

#### Text: The United States Federal Government should substantially increase funding for basic fusion and plasma physics research in the United States.

#### The CP solves all your spin-offs and attracts high-quality scientists into the field.

J. R. Cary,a et al, July 1999. A. Kritz,b G. Bateman,b D. B. Batchelor,c D. Boyd,d J. D. Callen,e B. Carreras,c J. M. Finn,f W. Gekelman,g J. B. Greenly,h M. Greenwald,i W. Heidbrink,j S. Knowlton,k W. Kruer,l J. N. Leboeuf,g G. Morales,g D. Newman,m R. Nebel,f S. E. Parker,a M. Porkolab,i P. Pribyl,g A. Reiman,n S. Robertson,a W. Tang,n P. Terry,e A. Ware,o M. Yamadan. a) University of Colorado, Boulder; b) Lehigh University; c) Oak Ridge National Lab; d) University of Maryland; e) University of Wisconsin, Madison; f) Los Alamos National Laboratory; g) University of California, Los Angeles; h) Cornell University; i) Massachusetts Institute of Technology; j) University of California, Irvine; k) Auburn University; l) Lawrence Livermore National Laboratory; m) University of Alaska; n) Princeton Plasma Physics Laboratory; Fairbanks; o) University of Montana. “A Strong Basic Plasma Science Program is Essential for the Fusion Energy Sciences Program,” Proceedings of the 1999 Fusion Summer Study, sites.apam.columbia.edu/SMproceedings/11.ContributedPapers/11.Cary\_etal.pdf.

A strong basic plasma science program is essential for the Fusion Energy Sciences (FES) Program. This has been recognized in that a distinct policy goal of the US fusion program is to “advance plasma science in pursuit of national science and technology goals.1” In this paper we discuss the benefits and components of a strong basic plasma science program, and we reaffirm the importance of this component of the US Fusion Energy Sciences Program. Basic plasma science can be directly and immediately relevant to the development of fusion energy, but much is of longer-term importance. The results of such plasma research often have far reaching implications. An example is the field of nonlinear dynamics, developed in the 50’s and 60’s by Kolmogorov and others. Fusion scientists and others further developed this field in the 60’s and 70’s, to the point where it has made a broad impact in condensed matter physics, accelerator physics, and astrophysics, to name just a few fields. At the same time, this work laid the foundation for our understanding of particle orbits (gyromotion, adiabaticity, stochastic motion) as well as particle heating in the collisionless limit and energetic particle losses in tokamaks and stellarators. For us to be able to develop the applied science that we will need over the next few decades, it is important that we lay the groundwork now with a vigorous research program in basic plasma physics. At this juncture, where we are trying to establish connections between MFE and IFE, basic plasma science is of particular importance. Many of the science working subgroups examined their fields in search of issues that cut across IFE and MFE. In this conference we have seen that the inevitable connection is at the basic science level. One example is computational science. Lagrangian methods are routinely used in IFE. They are now being introduced in MFE for the study of pellet injection. Another example is 3D equilibria with resonances. The science of self- consistent asymmetric equilibria arises in both Heavy Ion Fusion and stellarator research. The basic physics of wave-particle interactions and instabilities (both macroscopic and microscopic) also cuts across both IFE and MFE. -1-Basic plasma science research is an essential component of the FES Program as an element for attracting new scientists to our field. As was emphasized in Grunder’s opening talk, when the graduate students quit coming, the game is over. Graduate students are attracted to a field by exciting career opportunities or intellectual stimulation. A basic plasma science program, in which questions of a most general nature are addressed, provides intellectual stimulation and continues to do so even in tough budget times. However, for a basic plasma sciences program to work, it cannot be for only the youngest scientists. A working cadre of senior practitioners capable of supervising and appreciating this type of research must also be present. To build a strong basic plasma science program, we must ensure that the pursuit of fundamental plasma science can be carried out at some level without penalty. This means that we must ensure that members of our community are rewarded for such work. In hiring decisions it should be considered a positive factor that candidates show creativity in basic science as well as applied science – not just that they have recently worked on the current needs of the program, even though ability to contribute to programs will always naturally be a criterion. Fusion scientists must be allowed some time to pursue their basic plasma science interests; our program will benefit with the improved morale as well as from the new ideas that result. Of course, these statements apply even more strongly to our younger researchers, who will be counted on to generate the majority of new insights and innovative tools needed in the future. Basic plasma research must be an integral and well funded part of the Fusion Energy Sciences Program. In other programs, basic science research centers have been funded. Some large programmatic facilities allocate a fraction of machine time for investigating basic scientific issues, with the sole criterion for obtaining allocations being the quality of the proposed research. For this to work, experimental facilities must allot this fraction of time at the outset. The time must then be made available through a process that involves peer review. Such a process will naturally engage other communities in our research, thereby showing the intellectual richness of our endeavor. However, it must be recognized that there is significant work involved in drawing other communities in. There is natural inertia in all fields, so we must take the lead in showing how our facilities can be used to address questions in other fields. This requires that some of those familiar with our facilities make the effort to learn about other fields in order to establish connections and to be able to suggest possible ways that our facilities might be used to address basic scientific questions in other fields. Through this process, our community may be able to forge strong links with the basic turbulence community, the atomic physics and X-ray communities, and the space physics and astrophysics communities. Scientific communities gain in influence with the degree to which they are producers of broadly applicable scientific ideas. In the larger scientific community we are judged by the extent to which our scientific advances substantially impact other areas. This is reflected in part by how often our papers are referenced by the non-fusion community. To this end, our community should support work in basic plasma physics that is of interest to and used by other scientists, such as applied mathematicians, computational scientists in other fields, and fluid dynamicists. Examples -2- of basic plasma science that had broad scientific impact include chaos and nonlinear dynamics, soliton theory, nonneutral plasmas, and large-scale computation. Plasma scientists working in the areas of wavelet analysis, self-organized criticality, modern computational methods, massively parallel computing, data acquisition, scientific visualization, and high-dimensional nonlinear dynamics (e.g., turbulence), with sufficient support are likely to have an impact on other fields as well as making important contributions to plasma and fusion science. Our community has made important steps in this direction with the DOE/NSF basic plasma science program and the DOE Plasma Physics Junior Faculty Development Program. Refereed basic plasma grants, the young investigator awards, and the DOE Postdoctoral Fellowship Program have earned our field prestige in the larger scientific community. It is important that these programs be strengthened and publicized and continue to use the highest refereeing standards. (At the time of this writing, a next round of the DOE/NSF basic plasma science program seems to be in the approval process, it has not been announced.) These programs are also important because they bring in new blood from related fields; such scientists are more likely to become engaged in an open competition. We should further amplify basic plasma research by ensuring adequate computational resources for basic science, and by increasing our remote collaboration capabilities to ensure that basic plasma scientists can collaborate with the entire fusion community. Moreover, we should amplify this program by targeting additional funds to bringing new institutions into the program. (Only about 10% of US Ph.D. granting institutions currently have fusion plasma science programs.)

#### Government support of basic research is necessary, but investment in applied research displaces private capital and undermines innovation.

Kenneth P. Green, 2/24/2012. Resident scholar at the American Enterprise Institute. “Government Is a Lousy Venture Capitalist,” The American, http://www.american.com/archive/2012/february/government-is-a-lousy-venture-capitalist/article\_print.

In their article, “Lessons from the Shale Revolution,” Ted Nordhaus and Michael Shellenberger suggest that the success of hydraulic fracturing validates the idea that government “investment” is a reasonable and effective way to advance technology and to outperform market actors in finding and bringing cool new things to fruition. President Obama made the same argument in his 2012 State of the Union address, giving almost complete credit for hydraulic fracturing to Uncle Sam:

The development of natural gas will create jobs and power trucks and factories that are cleaner and cheaper, proving that we don’t have to choose between our environment and our economy.  And by the way, it was public research dollars, over the course of 30 years, that helped develop the technologies to extract all this natural gas out of shale rock–-reminding us that government support is critical in helping businesses get new energy ideas off the ground.

Nordhaus and Shellenberger come down unequivocally on the president’s side of this argument:

In fact, virtually all subsequent commercial fracturing technologies have been built upon the basic understanding of hydraulic fracturing first demonstrated by the Department of Energy in the 1970s.

They also suggest that the same approach will foster the development of renewable energies such as wind and solar power:

Indeed, once we acknowledge the shale gas case as a government success, not a failure, it offers a powerful basis for reforming present clean energy investments and subsidies.

This argument is a direct contravention of the conventional wisdom that while government has a legitimate and valuable role in basic science, technology, engineering, and mathematics (STEM) research, it is a lousy venture capitalist and is largely incapable of picking winning technologies in the market.

Critics of the government’s claim of credit argue, in essence, that the government pulled a Ferris Bueller: They saw a parade in progress, hopped up on a float, and started singing loudly and gesturing broadly. Now, they claim credit for the entire parade. This is a fairly common practice. Quite recently, President Obama claimed credit for increased oil and gas production in the United States, despite it being blatantly obvious that the increases came from state and private, not federal, lands.

But for argument’s sake, let’s stipulate to the premise that hydraulic fracturing technology represents a great government success. What can we learn from this shining example?

Not much, for two reasons:

1) One winning game does not a champion make. Nordhaus and Shellenberger take the fracking example in isolation, and ignore persuasive literature showing that “industrial policy” (the formal term for government picking winners and losers) has a history of abject failure. Some, such as Terence Kealey at the University of Buckingham, point out that Japan’s efforts at industrial policy (through an agency called MITI) were simply a disaster:

MITI, far from being a uniquely brilliant leader of government/industrial partnership, has been wrong so often that the Japanese themselves will concede that much of their growth derives from industry’s rejection of MITI guidance. MITI, incredibly, opposed the development of the very areas where Japan has been successful: cars, electronics, and cameras. MITI has, moreover, poured vast funds into desperately wasteful projects. Thanks to MITI, Japan has a huge over-capacity in steel—no less than three times the national requirement. This, probably the most expensive mistake Japan ever made in peacetime, was a mistake of genius because Japan has no natural resources: it has to import everything; the iron ore, the coal, the gas, the limestone, and the oil to make its unwanted steel. (p.111)

Kealey points to a comprehensive study of MITI interventions between 1955 and 1990, observing that:

Richard Beason of Alberta University and David Weinterin of Harvard showed that, across the 13 major sectors of the economy, surveying hundreds of different companies, Japan’s bureaucrats almost invariably picked and supported the losers. (p.111)

As Obama’s own economic adviser Larry Summers pointed out, the government is a bad venture capitalist. It has no greater ability to pick winners than does any private individual, but it can be far more reckless in its “investments” because there is no penalty for wasting money, and because it can use state force to favor cronies and rig outcomes. Sure, the government invested in hydraulic fracturing, but were their investments key to its success, or are they simply claiming credit for an accidental situation where something went right? Based on the evidence, the latter is more likely than the former.

2) Displacement is not addition. Studies show that **government “investment” in applied research** and development **does not add new money to the pot, it displaces private capital, and does so disproportionally**. When government steps in, it displaces more money than it throws in the pot.

Again, Kealey sums it up well using a study by the OECD:

Furthermore, regressions including separate variables for business-performed R&D and that performed by other institutions (mainly public research institutes) suggest that it is the former that drives the positive association between total R&D intensity and output growth... The negative results for public R&D are surprising and deserve some qualification. Taken at face value, they **suggest publicly performed R&D crowds out resources that could be alternatively used by the private sector, including private R&D.** There is some evidence of this effect in studies that have looked in detail at the role of different forms of R&D and the interaction between them. (p.19)

Kealey’s own research agrees:

Moreover, the OECD does not stand alone: at least two other researchers, Walter Park of the Department of Economics at the American University at Washington, D.C., and myself, have found—by similar surveys of OECD data—similarly damaging effects of the government funding of research and development.

#### It’s a unique case turn—VC is jumpstarting fusion commercialization now.

NPR, 11/9/2011. Richard Harris. “'Power For The Planet': Company Bets Big On Fusion,” National Public Radio, http://www.npr.org/2011/11/09/141931203/-power-for-the-planet-company-bets-big-on-fusion.

The world would be a very different place if we could bottle up a bit of the sun here on Earth and tap that abundant and clean energy supply. Governments have spent many billions of dollars to develop that energy source, fusion energy, but it's still a distant dream. Now a few upstart companies are trying to do it on the cheap. And the ideas are **credible enough to attract serious private investment**.

One such company is hidden away in a small business park in the suburbs of Vancouver, British Columbia. Nothing seems unusual here — there's a food distributor, an engineering firm and small warehouses. But on one door there's a sign suggesting that all is not normal.

The sign says "General Fusion" and warns people with pacemakers to proceed with caution.

The reason for that caution can be found behind bulletproof walls that surround an experimental machine. This gleaming metal structure could be out of a science fiction movie set. It stands 15 feet tall, is crisscrossed with wires and is covered with aluminum foil. Two men are hunched over an instrument, troubleshooting.

The machine is flanked with banks of electrical capacitors, which hold — and release — the amount of energy you find in a stick of dynamite. A siren warns to stay clear: The system is charging up, and with all that electric charge, some piece of hardware could go flying.

This plasma ray gun is part of a bigger instrument, which is still under construction. The goal, simply put, is to create a small piece of the sun and harness that energy.

"This is an insanely ambitious project," says Michel Laberge, the brains behind the project. He's a physicist and inventor with a rusty beard and a college-casual wardrobe.

Beating The Big Guys

This story really starts a dozen years ago, when the company where he was working asked him to join in a hot technology race that had nothing to do with energy. He was asked to build a switch for fiber optics communication cables.

"So I was in competition with Nortel, Bell Lab, Lucent," Laberge says. "All those guys were putting literally billions of dollars in this project. And they gave me half a million dollars, and one guy ... said, 'Do something that will work better than the other guy.' [And I said,] 'Oh, OK!' "

As Laberge tells the story, he actually succeeded.

"For half a million dollars, we beat the billion-dollars worth of work. So that inflated my head a little bit. I said, 'Hey, look at that. You can beat the big guy if you do something different.' "

So, on his 40th birthday, he quit his job in what he calls a midlife crisis, took the pile of money he'd earned at his old company, and decided to try something really revolutionary. With his Ph.D. in fusion energy, he thought he'd try to beat the big boys in the fusion field.

"Reason No. 1 is to save the planet. We are in deep poo-poo," Laberge says.

Fossil fuels will run out, and in the meantime they are causing global warming. Among the allures is that fusion reactors can't melt down, and they don't produce significant nuclear waste. And Laberge says if he succeeds, he could be worth billions.

"As for glory, I word that as a negative. I don't want glory. That's just a pain. I don't want anybody to know me, really. Not interested in the glory. I'll take the money, though," he says with a hearty laugh.

He knew he couldn't beat the existing multibillion-dollar fusion labs at their own game. So instead, he decided to combine ideas from the two current approaches to make a vastly cheaper machine.

A One-Two Punch

The general principle behind fusion is simple. If you can fuse together light atoms, you can create a heavier atom plus lots of energy. The trick is that in order to fuse atoms together, you need to provide enough energy to heat the atoms up to 150 million degrees Celsius.

"Other fusion uses a very complex way of producing energy — superconducting magnets, laser beams, all sorts of expensive and complicated and pricey stuff," he says. "It costs them billions and billions of dollars, so it's not so practical in my opinion. Here, what the energy source is, is compressed air. Compressed air is dirt cheap."

Think of his idea as a one-two punch. His big electrical gizmo starts to heat up the atoms. Those get injected into a 10-foot-wide sphere full of swirling molten lead.

"The liquid will be circulated with a pump, so it spins around and makes a vortex in the center. You know, like your toilet with a hole in the center," Laberge says.

And just as the heated atoms get into the center, Laberge fires 200 pistons, powered with compressed air, which surround the sphere. "Those are compressed air guns ... that send a big compression wave, squash the thing, and away you go!"

If all goes as planned, squashing the mixture heats it up enough to fuse the atoms and ignite nuclear reactions.

The concept is called magnetized target fusion. Laberge didn't invent the idea, but he re-imagined it, and, more to the point, he raised $30 million from Amazon.com founder Jeff Bezos and several venture capital firms to see if he can get it off the ground.

Ask Laberge if he thinks it will work, and you'll get an indignant reply: "Of course I think it's going to work! Do you think I'm going to spend 10 years of my life doing something I think won't work? I think it [has] a good shot of working."

He adds, "I wouldn't say I'm 100 percent sure it's going to work. That would be a lie. But I would put it at 60 percent chance that this is going to work. Now of course other people will give me a much smaller chance than that, but even at 10 percent chance of working, investors will still put money in, because this is big, man, this is making power for the whole planet. This is huge!"

Changing The Venture Capital Game

And the physics concept isn't the only big idea here: Laberge is also pioneering the idea that venture capital firms, which are used to taking big gambles but expect a quick payback, can sometimes have the patience to invest in a project they can't just flip in three years. Private funding could change the game for fusion energy.

Richard Siemon used to run the fusion program at Los Alamos National Laboratory, which is part of the multibillion-dollar federal research effort. He says radical ideas like this get dreamed up at the big labs, but they get starved for money, which flows mostly to the industrial-sized projects. Sure, he says, those big projects are exploring important physics, "but when they are working on a concept and somebody says, 'Yeah, but it's going to cost too much for the customer in the end,' that's sort of like a non-issue for a government researcher."

But private investors are only interested in projects that could become commercially viable power sources. That's why Siemon is happy to see private investors taking an interest in fusion energy.

"I really think that **venture capital might just come in at this point and pick the best fruits off the tree and run with them**," says the retired physicist.

In fact, Laberge's company is not the only one out there using private funds to build reactors based on magnetized target fusion and other novel concepts. Siemon says he's confident someone will eventually figure this out. And that may be an economic competitor.

### 1NC STEM Adv

#### Alt Cause – teaching methods

Qayoumi 3 – 18 – 13 President, San Jose State University [Mohammad H. Qayoumi Ph.D., Removing Obstacles to STEM Education is Critical to U.S. Vitality, <http://www.huffingtonpost.com/mohammad-humayon-qayoumi/removing-obstacles-to-ste_b_2903025.html>]

A major barrier to graduating more STEM majors is the way we teach these disciplines. My own personal experience is a good example. Until sixth grade, I was not good in math. This was partly due to the poor pedagogy and some teachers who were not able to contextualize the material to make learning fun and enjoyable.

Many decades later when I think of my math teacher in fourth and fifth grades, he embodied the angel of death. Going to class was unpleasant, and taking exams was a horrible experience. Consequently, my grades were mediocre at best.

When I began sixth grade, we had a new teacher who made math really fun. He was successful in changing my attitude toward math. Not only did I develop a deep interest and appreciation for the subject matter, but my grades dramatically improved. Most important, that enjoyment of a STEM subject has continued throughout my life. That is why I have an incandescent passion for this issue. It was only that chance of having a different teacher that changed the course of my academic career and, more than likely, the trajectory of many professional opportunities.

Making STEM Topics Relevant

It is unfortunate that in the current zeitgeist we have implicitly accepted child obesity, diabetes, and poor math performance as "a new normal." We need to increase the number of students we graduate in STEM by focusing on participation of underrepresented populations, like women and minorities, and by teaching STEM in new ways that engage students.

The prerequisite for accomplishing this mandate requires a significant improvement in the math competency of all students, but especially for women and students from underserved communities. We have to make the learning social, contextual, and relevant for these students. New instructional methodologies and innovative use of technologies can be a major tool in accomplishing this mandate.

Flipped classes and blended learning, where students watch online videos offered through companies like EdX and then participate in classroom discussion, are one way to use technology in higher education. Such a blended model helps students learn at their own pace before coming to the class and creates more peer-to-peer learning opportunities.

Fixing a Broken Funding Model

Another factor is contributing to the lack of STEM graduates: the poor funding model for higher education.

Affordable higher education is becoming available to fewer people. Research from the National Center for Education Statistics and the National Center for Public Policy and Higher Education shows an alarming trend of dramatically diminished state support for public higher education. Our public universities and colleges have increased tuition and fees and reduced administrative costs, but these efforts are not enough.

**No terrorist threat to the US – death of bin Laden shifted attack priorities**

**Mahadevan 3-22** [Prem, senior researcher at the Center for Security Studies, “The Glocalisation of Al Qaedaism,” http://www.isn.ethz.ch/isn/Digital-Library/Articles/Special-Feature/Detail/?lng=en&id=161729&contextid774=161729&contextid775=161659&tabid=1454211886]

This leads to the second develop­ment which has boosted Al Qaeda’s ideology locally: the death of Osama Bin Laden in May 2011. Documents captured by US forces in Afghani­stan and Pakistan during 2001 – 11 reveal that Al Qaeda was not mono­lithic; it was a tightly-knit coalition of different regional jihadist fac­tions. Bin Laden spent much of his time managing conflicting priorities between these factions: Some wanted to overthrow apostate Arab gov­ernments (the ‘near enemy’) while others wanted to attack the United States (the ‘far enemy’). Bin Laden himself was opposed to internecine warfare between Muslims and thus advocated long-distance attacks on Western homelands. His deputy and eventual successor, Ayman Al-Zawa­hiri, was on the other hand more interested in regional jihad. With Bin Laden gone, Zawahiri’s empha­sis on attacking the ‘near enemy’ has gained impetus.

### 1NC SO Adv

#### Spin-offs require different forms of plasma research outside of fusion—there are direct tradeoffs between research for fusion energy generation and for spin-off technology.

Dr. Kathy McCarthy, 7/31/2003.  Deputy Associate Laboratory Director for Nuclear Science and Technology at the Idaho National Laboratory, Ph.D. in Nuclear Engineering at the University of California , Los Angeles and Chair of the FESAC Panel, “Non-Electric Applications of Fusion”, Final Report to FESAC, http://science.energy.gov/~/media/fes/fesac/pdf/2003/Fesac\_final\_non\_elec\_2003.pdf.

Fusion might contribute a non-electric product such as hydrogen fuel directly or indirectly by helping fission produce the same product, such as by using fusion to produce fissile fuel, or by transmuting nuclear waste of fission reactors that produce the product. There are non-energy applications of fusion as well as non-electric energy applications that are valuable to US industry or public health, such as production of valuable radioactive isotopes, for example. In some cases the pursuit of non-electric applications may require the same research for fusion configurationoptimization and fusion technology as for electricity production, and in some cases not.

The traditional way of looking at what benefits fusion has to offer beyond electricity has been to point to the "spin-off" from plasma research and technology that has resulted from the construction of complex plasma experiments. Several Government summaries 1,2,3, individual reviews 4,5,6, and even a recent conference 7 have addressed the indirect benefits of these spin-offs to society that result from funding the fusion program. These benefits are real and impressive. However, essentially all of these commercial products come from non-fusion plasmas or equipment not specifically designed to handle fusion plasmas. The use of plasmas to provide UV to dry printed material, the use of RF generated plasmas to generate light for home use, and the use of RF generated plasmas for etching are only a few examples of commercial products that do not require an actual fusion event, just energetic ions (usually protons) or electrons. It can be convincingly argued that people are happy to accept the benefits that come from this research, but the fusion program is not funded to generate "spinoff", but rather to produce fusion energy in the long run. Therefore, this report will concentrate on only those products that come from fusing plasmas.

Since finite resources for fusion research might result in trade-offs of fusion research between electric and non-electric applications, evaluation of non-electric applications have to include not only feasibility, but also how their pursuit might change the technical direction of the fusion program away from the traditional ones needed for electricity. Such changes to the ongoing fusion program, if required for pursuit of any non-electric applications, would clearly have to be justified in terms of the classical metrics of cost, risk, and benefit. The panel therefore adopted the following three criteria to evaluate all of the non-electric applications considered:

1. Will the application be viewed as necessary to solve a "national problem" or will the application be viewed as a solution by the funding entity?

2. What are the technical requirements on fusion imposed by this application with respect to the present state of fusion and the technical requirements imposed by electricity production? What R&D is required to meet these requirements and is it "on the path" to electricity production? For example, what are the requirements for:

- Q

- Power density

- Pulse length/efficient current drive

- Availability/reliability/maintainability

- Tolerable disruption frequency

- Tritium breeding, handling, and processing

- Materials

- Thermal efficiency/high temperature operation

- Economic operation

- Schedule to initial commercial operation

3. What is the competition for this application, and what is the likelihood that fusion can beat it?

#### Fusion is always 20 years away—no chance it ever becomes a cost-competitive source of power.

Charles Seife, 1/3/2013. Correspondent for Science. “Fusion Energy’s Dreamers, Hucksters, and Loons,” Slate, http://www.slate.com/articles/health\_and\_science/nuclear\_power/2013/01/fusion\_energy\_from\_edward\_teller\_to\_today\_why\_fusion\_won\_t\_be\_a\_source\_of.html.

Just a few weeks ago, a bunch of fusion scientists used South Korean money to begin [designing a machine that nobody really thinks will be built](http://www.princeton.edu/main/news/archive/S35/60/40I47/index.xml?section=topstories) and that probably wouldn't work if it were. This makes the machine only slightly more ludicrous than the one in France that may or may not eventually get built and, if and when it's finally finished, certainly won't do what it was initially meant to do. If you've guessed that the story of fusion energy can get a bit bizarre, you'd be right.

For one thing, the history of fusion energy is filled with crazies, hucksters, and starry-eyed naifs chasing after dreams of solving the world's energy problems. One of the most famous of all, [Martin Fleischmann](http://www.nytimes.com/2012/08/12/science/martin-fleischmann-cold-fusion-seeker-dies-at-85.html?pagewanted=all&_r=0), died last year.[\*](http://www.slate.com/articles/health_and_science/nuclear_power/2013/01/fusion_energy_from_edward_teller_to_today_why_fusion_won_t_be_a_source_of.html#correction) Along with a colleague, Stanley Pons, Fleischmann thought that he had converted hydrogen into helium in a beaker in his laboratory, never mind that if he had been correct he would have released so much energy that he and his labmates would have been fricasseed by the radiation coming out of the device. Fleischmann wasn't the first—Ronald Richter, a German expat who managed to [entangle himself in the palace intrigues](http://en.wikipedia.org/wiki/Ronald_Richter) of Juan Peron, beat Fleischmann by nearly four decades—and [the latest schemer](http://ecat.com/), Andrea Rossi, won't be the last.

The reason's easy to see: On paper, fusion energy has almost unlimited potential. A fusion reaction releases an extraordinary amount of energy by slamming together light atoms, such as hydrogen, to make heavier ones, such as helium. (Fission is essentially the opposite: breaking apart heavy atoms, such as uranium, to make lighter ones.) Fusion is the same process that powers the sun—and it's so efficient that we'd have enough atomic fuel on Earth to satisfy our civilization's need for energy for, essentially, forever. The problem is that it's really hard to slam those atoms together hard enough. You need incredibly high temperatures, tens or hundreds of millions of degrees Celsius, so that the atoms are moving fast enough to get the reaction going. But as you heat your fuel up, you have to keep it contained. A 100-million-degree plasma wants to explode in all directions, but if you're going to keep the reaction going, you have to keep it bottled up. What do you make the bottle out of?

Advertisement

The sun's bottle is gravity. Because the sun is so massive—more than 300,000 times the mass of our planet—it has an enormous gravitational field. It's this field that compresses and constrains the hydrogen fuel and keeps it from flying off every which way. But without a sun-size mass to provide the gravity, you've got to find other ways.

One way—and it works beautifully—is to use an atom bomb as the bottle. On Nov. 1, 1952, America used fusion energy to wipe the Pacific island of Elugelab off the face of the planet. The device at the heart of the "[Ivy Mike](http://www.ctbto.org/specials/infamous-anniversaries/1-november-1952-ivy-mike/)" test was essentially a big, chilly tank of heavy hydrogen. At one end was a Nagasaki-type plutonium bomb, which, when it exploded, compressed the fuel, heated it to millions of degrees, and kept it bottled up. For a fraction of a second, we unleashed the power of the sun upon the surface of the Earth. The bomb that leveled Hiroshima was the [equivalent of about 15 kilotons of TNT](http://www.nuclearpathways.org/Docs/pdfs/00313791.pdf). Ivy Mike was about 10 megatons, nearly 700 times as powerful. And there is theoretically no upper limit to how large you can make these devices if you so desire. (The Soviet Union detonated a [50-megaton whopper](http://www.ctbto.org/specials/infamous-anniversaries/30-october-1961-the-tsar-bomba/) in the 1960s.)

[The design works](http://nuclearweaponarchive.org/Library/Teller.html), but it’s a pretty poor solution to the world's energy needs. It's tough to turn a fusion weapon into a safe supplier of electricity. That isn't to say we haven't tried to harness the H-bomb. Edward Teller, the Strangelove-ian father of Ivy Mike, tried to convince the world that fusion weapons could be used for peaceful purposes, from [controlling the weather](http://books.google.com/books?id=LSYDAAAAMBAJ&pg=PA81&lpg=PA81) to [nuclear fracking](http://www.atomictourist.com/gasbug.htm) to [carving an Alaskan harbor out of bedrock](http://arcticcircle.uconn.edu/SEEJ/chariotseej.html) to nuking the moon. Yes, Edward Teller wanted to nuke the moon to, in his words, "observe what kind of disturbance it might cause."

Teller's dream of unlimited fusion energy didn't die with him. The Lawrence Livermore National Laboratory, Teller's former stomping grounds, is now the site of a monstrous $4 billion-plus fusion project known as the National Ignition Facility. The idea is to compress and bottle up a pea-sized pellet of hydrogen by using a laser so huge that it would make any red-blooded moon-nuking megalomaniac proud. The putative goal is to generate more energy through fusing hydrogen atoms than the energy that was put in by the laser in the first place. And NIF scientists say that [they'll achieve success in 2010](http://cosmiclog.nbcnews.com/_news/2010/01/28/4350708-is-fusion-success-in-sight) ... rather, they'll achieve success by October 2012 ... rather, NIF has succeeded at the crucial goal of showing that Livermore scientists' predictions of success were all dead wrong.

It's par for the course. Livermore has been predicting imminent success with laser fusion since the late 1970s—always failing miserably at fulfilling every prediction. In fact, critics (myself included) have long said that all the chin music about NIF being a source of fusion energy was nonsense. The laser is designed for studying nuclear weapons, not for generating energy. (And it won't even do the weapons job very well.) Yet scientists at Livermore keep pretending that their hyper-expensive laser research is somehow going to produce fusion energy, even though they've got to go through Rube Goldberg-esque variations of the idea to make it look like they've got a shot at success. (For those keeping score at home, [the latest project, too](https://str.llnl.gov/JulAug11/dunne.html), will be an abject failure if it ever gets funding.)

Livermore is far from alone when it comes to overselling fusion. Way back in 1955, before the invention of the laser, physicists were predicting that fusion energy would be [on tap within 20 years](http://books.google.com/books?id=sUEEAAAAMBAJ&pg=PA177&lpg=PA177). Back then, the only workable method of bottling up a cloud of million-degree hydrogen, short of setting off an atomic bomb, was to use giant magnets. At that time, a number of scientists around the world attempted to design machines that would [heat and confine burning hydrogen](http://diglib.princeton.edu/pdfs/PPL001/c0002.pdf) clouds with powerful electromagnetic fields. They didn't work as predicted; even after [decade](http://news.bbc.co.uk/2/hi/science/nature/7190813.stm) upon [decade](http://select.nytimes.com/gst/abstract.html?res=F60712F93F5F167493C0AB1788D85F428785F9) of false starts, the magnetic bottles were just too leaky. Yet fusion energy was still always just around the next corner.

Magnetic fusion wasn't just for the Americans, but also for the Soviets, the Germans, the Japanese, the British—everybody who was anybody had a magnetic fusion program that would put power on the grid within the next few decades. At least this was the case until the 1985 Soviet-American Summit in Geneva, when Reagan and Gorbachev agreed that our countries would [research fusion energy together](http://millercenter.org/president/speeches/detail/3924). Within a few years, everybody who was anybody was now part of a big multibillion-dollar project to build a giant magnetic fusion bottle known as ITER.

It takes a truly international effort to create something as powerfully screwed up as ITER. Yet if your only source of information were the [ITER project's own history](http://www.iter.org/proj/iterhistory), you'd have no clue just how rocky the project has been behind the scenes. There's no mention of the nasty battles over cost overruns in the late 1980s and early 1990s. There isn't any hint of how scientists working on domestic fusion projects—whose budgets were getting eaten by ITER—worked behind the scenes to scuttle the international project. (And they succeeded: In 1998, the United States pulled out of the project, sending the whole endeavor back to the drawing board.) There's no sign of the dramatic scaling down of the machine's design (ITER had become ITER-Lite). Nor is there any acknowledgement that the new, cheaper, machine would simply be unable to achieve ITER's original goal of "ignition and sustained burn"—a fusion reaction that can be kept going indefinitely.

In the aftermath of the U.S. pullout, the remaining partners regrouped, settled on the cheap design and a bare-bones budget. The United States then rejoined, and construction crews even broke ground in France for the reactor site. ITER is currently under construction in France. But despite these hopeful developments, the reborn project is foundering—dragged down by the very same forces that doomed the original ITER. The bare-bones budget ([supposedly around $5 billion](http://bric.postech.ac.kr/science/97now/03_1now/030131d.html) when the United States rejoined the project) has swollen back up to Falstaffian proportions (the latest estimate is [$20 billion](http://news.sciencemag.org/sciencenow/2012/08/how-to-line-a-thermonuclear-reac.html)), and each year, the estimated completion date just keeps getting pushed further and further into the future. (A [quick look into the Internet wayback machine](http://web.archive.org/web/20110717024135/http%3A/www.iter.org/proj/iterandbeyond) shows the [dates in flux](http://www.iter.org/proj/iterandbeyond).)

The present trajectory of the reborn ITER looks incredibly familiar to anyone who watched the original project go down in flames. First comes ballooning costs and schedule slippage, and then, like clockwork, the United States begins to have difficulty coming up with the money it promised. Back in 2008, U.S. officials started telling Congress that, given tight budgets, we were likely [not going to be able to shoulder](http://www.aip.org/fyi/2008/107.html) our agreed-upon share of the ITER project costs. In an attempt to come up with the money, the Department of Energy has been squeezing our domestic fusion program, but there simply isn't enough cash to go around. (As Sen. Dianne Feinstein asked Secretary of Energy Steven Chu in March, "And if we continue to fund [ITER], where would the $300 million [for our soon-to-be annual ITER contribution] come from?" Secretary Chu's answer: "Senator, [you're asking a very important question we've asked ourselves](http://www.aip.org/fyi/2012/045.html).") Naturally, domestic fusion scientists whose budgets are being slashed [are freaking out](http://www.physicstoday.org/resource/1/phtoad/v65/i12/p14_s1?bypassSSO=1).

Viewed against this backdrop, the recent announcement by Princeton Plasma Physics Laboratory that it's working with South Korea to design a fusion reactor—one that doesn't have a snowball's chance in hell of ever being built—demonstrates the chaos that's gripped the fusion community. The scientists at PPPL are promising a billion-watt demonstration fusion power plant in the 2030s (20 years away!), without using any data from ITER. Since the whole point of ITER is to assist in the design of a demonstration fusion power plant, the implication seems to be that the $20-billion project is pretty much superfluous. (Without any sense of cognitive dissonance, even ITER's website suggests that scientists will [complete the design of a demonstration power plant in 2017](http://www.iter.org/proj/iterandbeyond), two years before ITER gets plugged in, at the same time they emphasize how crucial ITER is to the prospect of a future fusion power plant.)

Given this history, it's easy to understand why fanatical devotees gravitate to unorthodox approaches to fusion energy, be they [cold-fusion moonbattery](http://www.infinite-energy.com/) or schemes [touted by startup](http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=2113506) companies with more cash than brains. The mainstream scientists who've been pursuing the dream have left us with little more than a thicket of delusions and broken promises. And, if one is to believe them now, after six decades of work, the clean, nearly limitless power of fusion is still 20 years away. At this rate, it will always be.

#### Even if we can produce fusion energy, it won’t be cost effective.

Robert L. Hirsch, 10/16/2012. Former senior energy program adviser for Science Applications International Corporation and is a Senior Energy Advisor at MISI and a consultant in energy, technology, and management. His primary experience is in research, development, and commercial applications. He has managed technology programs in oil and natural gas exploration and petroleum refining, synthetic fuels, fusion, fission, renewables, defense technologies, chemical analysis, and basic research. “Where to Look for Practical Fusion Power,” Presentation at 14th U.S.-Japan IECF Workshop, http://dotearth.blogs.nytimes.com/2012/10/19/a-veteran-of-fusion-science-proposes-narrowing-the-field/.

We learn; we learn more; we learn throughout life.  Some learning is easy; some is very difficult. After my experience in fusion research and many other energy technologies, I feel that I’ve learned where we might look for practical fusion power.  Part of that learning comes from where practical fusion power is not likely to be found.

Fusion is not like fire, although some fusion researchers seem to think so.  Fire became a major source of energy for early humankind, partly because it provided special capabilities, and it had essentially no competition.  Also, there were no cost or environmental issues to be concerned with when humans discovered fire and learned to use it.  Fire worked; it was convenient, and it did wonderful things when measured by then-existing lifestyles.

Fusion research started after World War II at a time when it was felt that science had wonderful things to provide for humankind.  The potential cost of fusion power was not an issue.  The wonders of the atom, or more properly the nucleus, were felt to be unbounded.  Fusion was the fundamental energy source in the universe, powering the sun and the stars.  Wonders awaited.

Many outstanding people turned to the pursuit of fusion power.  A number of fusion concepts emerged and were investigated.  Soon it became painfully clear that practical fusion power would not happen quickly.  First, we had to develop the science of plasma physics.

After decades of effort, a great deal has been learned and accomplished, but a practical fusion power concept has not been forthcoming.  Note that I said ”practical fusion power.”  Unlike fire, fusion power has to compete against a number of other options.  The word “practical” means that a fusion power system must be desirable, based on the realities of the society into which it will be introduced.

An unfortunate problem today is that many people in fusion research believe that producing a fusion-something that simply works is the goal, but that is definitely wrong!  Fusion power and fire are distinctly different.

Let’s consider some specific criteria for practical fusion power.  In 1994, the U.S. Electric Power Research Institute – EPRI – convened a panel of utility technologists to develop “[Criteria for Practical Fusion Power Systems](http://rd.springer.com/article/10.1007/BF02213958#page-1).” The result was a four-page folder that outlined “Three principal types of criteria:”

Economics,

Public Acceptance, and

Regulatory Simplicity.

The criteria are almost self-explanatory, but let me quote from the Economics Criteria:  “To compensate for the higher economic risks associated with new technologies, fusion plants must have lower lifecycle costs than competing technologies available at the time of commercialization.”  Details for the criteria are given in the report, which I commend to anyone motivated to help develop fusion power.

Against these criteria, let’s consider tokamak fusion, the centerpiece of which is ITER – the International Thermonuclear Experimental Reactor – under construction in France.  As we know, it’s an enormously large machine, which is generally considered to be a prototype of a practical fusion power plant.

Comparing the ITER and the core of a comparable commercial fission reactor shows an enormous difference in size – a factor of 5-10 — ITER being huge by comparison to a fission reactor core.

It is known in engineering and technology development that the cost of a finished machine or product is roughly proportional to the mass of the device.  Eyeballing ITER compared to a fission reactor core, it’s obvious that an ITER-like machine is many times more massive.  Yes, you can argue details, like the hollow bore of a tokamak, but the size of the huge superconducting magnets and their heavy support structures provides no relief.

Bottom line – On the face of it, an ITER-like power system will be much more expensive than a comparable fission reactor, so I believe that tokamak fusion loses big-time on cost, independent of details.

Next, consider the fact that deuterium-tritium fusion inherently emits copious neutrons, which will induce significant radioactivity in adjacent tokamak structural and moderating materials.  Accordingly, a tokamak power system will become highly radioactive as soon as it begins to operate and, over time, radiation damage will render those same materials structurally weak, requiring replacement.

In the U.S., as elsewhere in the world, we have a Nuclear Regulatory Commission, which will almost certainly be given the task of ensuring that the public is safe from mishaps associated with tokamak power system failures.  Expected regulation will require all kinds of safety features, which will add further costs to tokamak power.

While the character of the plasma in a tokamak power reactor will not likely represent a large energy-release safety issue, the superconducting magnets would contain a huge amount of stored energy.  If those magnets were to go normal – lose their superconducting properties – the energy release would be very large.  It can be argued that the probability of that happening will be small, but it will nevertheless not be zero, so the regulators will require safety features that will protect the public in a situation where the magnets go normal, releasing very large amounts of energy.

Accordingly, it is virtually certain that the regulators will demand a containment building for a commercial tokamak reactor that will likely resemble what is currently required for fission reactors, so as to protect the public from normal-going superconducting magnet energy release.  Because an ITER-like tokamak reactor is inherently so large, such a building will be extremely expensive, further increasing the costs of something that is already too expensive.

Next, there’s the induced radioactivity in the structure and moderator of a tokamak power reactor.  Some tokamak proponents contend that structure might be made out of an exotic material that will have low induced radioactivity.  Maybe, but last I looked, such materials were very expensive and not in common use in the electric power industry.  So if one were to decide to use such materials, there would be another boost to cost, along with an added difficulty for industry to deal with.

No matter what materials are chosen, there will still be neutron-induced materials damage and large amounts of induced radioactivity.  There will thus be remote operations required and large amounts of radioactive waste that will have to be handled and sent off site for cooling and maybe burial.  That will be expensive and the public is not likely to be happy with large volumes of fusion-based radioactivity materials being transported around the country.  Remember the criteria of public acceptance.

I could go on with other downsides and showstoppers associated with tokamak fusion power, but I won’t.  It is enough to say that tokamak fusion power has what I believe are insurmountable barriers to practicability and acceptability.

By the way, my arguments assume that tokamak physics and technology works well and is reasonably simple, meaning that not many more components will have to be added to the system to allow it to operate on a steady basis for very long periods of time between the long shutdowns needed to change out radiation-damaged, radioactive materials.

What I’ve just described is not a happy story.  At some point, probably in a matter of years, a group of pragmatic power industry engineers will be convened to seriously scrutinize tokamak fusion, and they are virtually certain to declare that it cannot become a practical power system////

. That will certainly be a calamity for the people involved and for the cause of fusion power.

Let’s review what I’ve said.  First, we have to recognize that practical fusion power must measure up to or be superior to the competition in the electric power industry.  Second, it is virtually certain that tokamak fusion as represented by ITER will not be practical.

So where are we likely to find practical fusion power?  First, we must look for a concept or concepts that are inherently small in size, which means high plasma density.  Second, we must look for something that can be based on a low or zero neutron fusion reaction.  One example is the proton-boron reaction.

We know some things about proton-boron fusion.  First it requires much higher temperatures that deuterium-tritium.  Second, it cannot be based on a Maxwellian plasma particle distribution, because theory tells us that the plasma radiation losses (Bremsstrahlung) from a very high temperature, Maxwellian, proton-boron plasma will kill the concept.

That means that a proton-boron plasma must be non-Maxwellian, and it must be fashioned in such a way that normal inter-particle scattering reactions can be managed on an on-going basis.

For this audience, the requirements for practical fusion power sound like they could be met by [Inertial Electrostatic Confinement](http://en.wikipedia.org/wiki/Inertial_electrostatic_confinement) (IEC) fusion.  As you well know, IEC is a family of possibilities from gridded systems to magnetically constrained systems and on and on.  They can in principle be very high density and therefore small, and they could have plasma distribution control as an element.  I can’t help but wonder if IEC just might be the key to practical fusion power.

In conclusion, in the early days of the U.S. fusion research, the program was classified secret and called Project Sherwood.  One explanation for that name was, if it works, it sure would be wonderful.

I hope that you and others will be able to help make it happen.

Thank you.

PS.  These thoughts were painful to formulate.  As a past leader of the U.S. federal fusion program, I played a significant role in establishing tokamak research to the U.S., and I had high hopes for its success.  Realities have emerged to dash those hopes.  When we learn unpleasant things, it is incumbent on us to speak up, even when it hurts.

## \*\*\* 2NC

### AT: Plan Doesn’t Pick Winners (Nelson 12)

#### Private funding is better suited to find the designs that will actually translate well to market. Government-backed researchers working in labs are likely to discount practical concerns and select designs that are less likely to survive in the market.

Elizabeth Iorns, 7/12/2012. Co-Founder & CEO of Science Exchange, former Assistant Professor at the University of Miami, Ph.D. in Cancer Biology from the Institute of Cancer Research in London. “Should Applied Funding Go To Academia Or Startups?” Science Exchange Blog, http://blog.scienceexchange.com/2012/07/should-applied-funding-go-to-academia-or-startups/.

There has recently been a subtle, but important, shift in the focus of government support for scientific research.

With NIH funding capped at 2012 fiscal levels, government programs have shifted support to applied & translational research, rather than traditional R&D platforms. The new “Big Data R&D Initiative”, for instance, will put $200 million into commitments for applied tools and techniques in biomedical research.

And while it’s certainly exciting to see federal funds go towards translational research, it is somewhat worrying to see how these funds are to be distributed. The NIH typically awards grants to academic groups with little commercial experience, and the new applied research funds are no different. The NHGRI, for instance, has awarded $20 million in grants to support the development of NGS data analysis software; but all grant recipients are academic labs with not a single startup or commercial partner.

As an entrepreneur myself, this brings up a series of concerns:

Quality: Will the resulting products of these grants be useful? In my experience, startups are simply more efficient at translating ‘needs’ to products. Because they operate on commercial incentives, startups are better at iterating to ensure their software development efforts fit their customer’s needs. In comparison, academic labs seem divorced from the end user, and have less willingness and/or incentive to engage in lean customer development processes.

Sustainability: Will the funded efforts actually be sustainable? Startups, as opposed to academic labs, often are better founded to generate sustainable businesses. If you look at other startups in the “Big Data R&D” space, like DNANexus or CDD, they are focusing on commercial business models to ensure longevity of their operations. Academic labs, on the other hand, are accustomed to basic research incentives that are divorced from commercial outcomes. Consequently they are more often reliant on continuous government funding for longevity.

Unfair / illegal competition: Existing startups such as NextBio and SolveBio are already developing solutions to large-scale applied data analysis. It would seem that some of the recent grants will fund efforts that essentially duplicate the work of these startups. Is this is really the best use of federal funds? Is it even legal given the federal government shouldn’t provide or support a service which can be procured through ordinary business channels?

A pointed case study is that of an $12.2 million ARRA grant, awarded to an academic consortium to create a social networking tool for scientists. After 3 years, the tool has not been widely adopted and it is unclear what impact (if any) it has had, while commercial startups tackling the same problem, suchAcademia.edu and Research Gate, have seen considerable traction (each with over 1 million users). Simply put, academic institutions do not operate at the same standards of speed, efficiency, or reproducibility as startups, who by contrast must optimize best practices to compete and ensure applied outcomes.

Rather than focusing on exclusive support for academic labs, the NIH and NHGRI should make greater use of public-private partnerships and SBIR grants that support commercial startups to achieve applied outcomes.  The 1000 Genome Project within the Big Data Initiative is a notable example of a public-private partnership, where the NIH is partnering with Amazon Web Services to provide data sets for free to researchers. Similarly, SBIR grants have supported commercial startups that have, in turn, laid the foundation for ground-breaking advancements in scientific research. The development of Illumina’s BeadArray technology was funded by a $21 million SBIR for instance, which has since become an industry standard.

### 2NC Innovation NB

#### Dependence on government funding for applied research undermines innovation and decreases likelihood of commercialization—micro-economic studies prove.

Yaichi Aoshima, Kazunari Matsushima, and Manabu Eto, February 2011. Hitotsubashi University, Institute of Innovation Research. “Commercialization of Government Funded R&D: Follow-up Research Survey on NEDO Research Projects,” Institute of Innovation Research, Hitotsubashi University, Working Paper, http://hermes-ir.lib.hit-u.ac.jp/rs/bitstream/10086/18926/5/070iirWP11\_02.pdf.

Summary This paper draws on data obtained from a questionnaire survey conducted for the 242 private R&D projects supported by NEDO (New Energy and Industrial Technology Development Organization), Japan’s public management organization promoting R&D, to explore how dependence on government support affects processes of private R&D projects and, in turn, the performance and commercialization of developed technologies. Our analyses show that projects receiving more than a half of their entire R&D expenditures from NEDO tend to be isolated from in-house departments. Such isolation, derived mainly from the projects’ unique positions in “double dependence” structures, negatively affects project performance, especially those related to commercialization, in two ways. First, **high dependence on government resources** **prevents project members from interacting with people outside the project within the company**. This inhibits project members from effectively leveraging internal resources - both technological and human - to overcome technological problems. Secondly, **such high dependence weakens internal controls over project activities**. This causes delayed development of marketable technologies and makes it difficult for projects to achieve justification for further investment required for commercialization. Our findings suggest that for successful R&D leading to commercialization, both companies and public funding agencies should encourage projects to maintain close relationships with other internal departments.2 1.Performance of Government Funding for R&D activities in Private Sectors Although government support for private R&D has exhibited a downward trend in countries around the world in recent years, including a reduction in the US military budget, for example, such support remains at a scale that cannot be ignored. In Japan, for example, nearly 20% of the 19 trillion yen in R&D expenditures by the private sector was supported with government funding in 2008 [1]. For many countries, innovation that will create economic values has become a vital issue as the maturation of various industries accelerates in tandem with increasingly severe global competition. Given such circumstances, in recent years there has been no lack of instances in which government funding has flowed **not only into basic research, but into applied research** and product development that will lead to commercialization as well. In the United States the Bayh-Dole Act, which was enacted in 1980 and enables firms to retain ownership of the results from government funded R&D, is said to have accelerated R&D undertaken by private firms with government support and commercialization of the R&D results. In response to this change, the so-called “Japanese-version Bayh-Dole Act” (Act on Special Measures for Industrial Revitalization, Article 30) was enacted in Japan as well in 1989, making it easier for firms to receive government support for the development oftechnology that differentiatestheir products in the market. On the other hand, as the fiscal condition in each country is tight, the use of public funds is being subjected to sharp public scrutiny. The merits of such uses are especially easy to question when public funds are lavished on R&D in a way that encourages commercialization at specific firms. Under such conditions, it is no longer possible to steer around questions asking “Does government funding really promote private R&D activities?” and “Why should we be spending our tax money on private sector activity?” when deciding appropriate government funding measures.3 Among existing research there are many studies that have attempted to quantitatively clarify the effects of government funding at the industry and national levels [2], [3], [4]. On the other hand, there is little research from a micro-economic viewpoint that looks specifically at which processes are followed by projects that receive government funding to produce results. To use public funds effectively, however, it is necessary to understand not only the results at the macro level, but to also supplement such understanding with an analysis of the specific processes by which projects that receive government funding achieve their results. Particularly when government support extends even to applied research and product development, and the results from development belong to a specific firm, determining whether firms are able to create new businesses from R&D and create economic values becomes an important factor for measuring the effects of government funding. From this perspective as well, research on the project level management is needed. Investigating the project management of government-funded R&D also raises several theoretical questions since it is distinct from those of ordinal private sector R&D projects. Government funding is significant in promoting R&D that, despite its importance, tends to suffer from underinvestment if left to the private sector [5], [6]. By liberating R&D activity from the severe and short-term profit pressures at profit-seeking enterprises, government funding has an effect of promoting R&D with a long-term view. For that very reason, however, the commercialization incentives could be inhibited for R&D projects that are isolated from the selection process within private firms. With public institutions that support R&D as well, some doubt remains - despite project evaluations being conducted by teams of experts - as to whether such institutions are capable of making appropriate assessments concerning the possibility of 4 commercialization. Moreover, projects might be isolated organizationally or professionally from other departments, and the ability to exchange information within the firm obstructed, as a result of receiving government funding. There is also a possibility the use of human and technical resources within a company will be restricted due to such isolation. Differing from typical R&D projects at private firms, government funded R&D projects need to consider these additional issues for successful development and commercialization.

#### The act of receiving government funding itself undermines commercialization.

Yaichi Aoshima, Kazunari Matsushima, and Manabu Eto, February 2011. Hitotsubashi University, Institute of Innovation Research. “Commercialization of Government Funded R&D: Follow-up Research Survey on NEDO Research Projects,” Institute of Innovation Research, Hitotsubashi University, Working Paper, http://hermes-ir.lib.hit-u.ac.jp/rs/bitstream/10086/18926/5/070iirWP11\_02.pdf.

With each country struggling under stringent fiscal conditions, the impact of government funding on private sector R&D also continues to be subjected to greater scrutiny than ever. Given such circumstances, significant effort has been made to strictly measure the effects government funding has on changes in private sector R&D, and the existing researches have understood the effect of government funding on encouraging (or limiting) private sector R&D mainly at an industry, national or similar macro level. The accumulated research a micro-level addressing the question of how the results of private sector R&D projects are affected by the receipt of government funding, on the other hand, remains thin. Based on this awareness, the present study was aimed at supplementing existing research by undertaking an analysis focused on the micro-level process by which government funded projects produce results. One important finding of this study is that, when viewed at the project level, **the act of receiving government funding itself entails some danger of hindering the commercialization of a project’s results**. The significance of government funding for private sector R&D lies in the fact it achieves a socially appropriate allocation of R&D resources, by providing support for technologies that are not profitable but which have social value, or by providing support for the development of technologies which, although they are expected to generate considerable economic value in the future, engender risks that private 23 corporations cannot accept because of the high degree of uncertainty. Viewed from the firm side, because the profitability of the R&D investment is enhanced by the receipt of public funds, government funding enables an enterprise to undertake, from a long-term perspective, R&D activity it had rejected in the past. The present study also showed that in contrast to this positive aspect of government funding, there is also a negative aspect from a project management standpoint. When public funds are tilted toward private sector R&D activity aimed at commercialization, there is a tendency for project activity to be shut off from the exchange of information with other internal departments. Therefore, compared with the ordinal R&D activity within the firm, the use of internal resources is limited, which has a negative effect on commercialization. We also find that high dependency on government funds tend to prevent a project to receive less involvement of other internal departments pertaining commercial feasibility, which also hinders technological performance.

### 2NC Basic Solves Spin-Offs

#### Major technological innovations will come out of basic research, but government investment at the applied R&D level undermines that innovation.

John Polanyi, 5/15/2009. Nobel laureate and member of the chemistry department at the University of Toronto. “Canada's timid approach to science funding will bring diminishing returns,” Globe and Mail, http://www.theglobeandmail.com/commentary/canadas-timid-approach-to-science-funding-will-bring-diminishing-returns/article4273226/.

Accordingly, in the midst of an economic crisis, Mr. Obama treated his audience of top American scientists to a gung-ho address. In a declaration of faith in the power of the undiscovered, he committed his administration to increasing expenditure on research, bringing it above 3 per cent of U.S. GDP. (The figure for Canada is about 1.8 per cent).

Noteworthy was his espousal of basic science. U.S. funding agencies' expenditures on it will double, whereas Canada's granting bodies for basic science have recently been cut by more than $145-million over three years.

"Basic scientific research," Mr. Obama said, quoting Vannevar Bush, "is scientific capital." That aphorism stands as a rebuke to those in this country who regard basic science as cash in hand, to be directed to the short term. But governments that treat basic science as a current account to be drawn on will soon encounter a law of diminishing returns. Unwilling to replenish the store of knowledge, they will lower their buckets into the well until they come up dry.

What basic research consists in - done right - is the systematic advancement of understanding of the physical world. This is done largely in universities, since it embodies the experience that students should share. Together, our students and our basic research represent an investment in our future.

Mr. Obama's central message to his countrymen is to invest in the long term, to behave as if they have a future. In Canada, favoured as we are, we find this hard.

But the rewards for timidity are modest. **Directing basic research to applied goals**, as we do through numerous university-industry partnerships, **is a flawed operation**. Sometimes it works. This is the case when the links between new knowledge and its applications are clear. But if apparent to the bureaucracy, they are also apparent to others. The likelihood of stealing a march on the rest of the world is correspondingly small.

Substantial technological innovations are less easy to link to the new ideas that make them possible. These are, of course, the technologies that governments in their roseate dreams hope to encourage by selecting "relevant" basic science.

Mr. Obama's advisers might recall that, in 1937, the same National Academy of Sciences was charged with making a study of emerging technologies. It reported that the major growth areas in applied science would be found in novel means of farming, in manufacturing synthetic gasoline and in the introduction of synthetic replacements for natural rubber.

They had rightly grasped that there was a coming crisis in resource availability. What they overlooked - understandably, since the clues were hidden among so many others - was the imminent emergence of nuclear energy, antibiotics, jet aircraft, space travel and computers.

These **powerful technologies emerged because the new opportunities thrown up by basic science were seized**, not because the basic science itself was targeted. Quite the contrary - it was freedom of inquiry in basic research that permitted far-reaching new concepts to flower. These then led, from the bottom up, to ground-breaking technologies.

**It is an abiding mystery why, having failed so definitively to pick winners in the marketplace for goods, governments have been empowered to pick winners in the far more subtle marketplace for ideas**.

### 2NC VC Solves Now

#### Government-backed fusion projects consistently fall behind schedule—a new wave of privately funded companies are leveraging venture capital and are likely to achieve commercialization faster.

Mark Halper, 1/28/2013. UK-based freelance journalist and blogger for the Weinberg Foundation, a UK-based not-for-profit organisation dedicated to advancing the research, development and deployment of safe, clean and affordable nuclear energy technologies. “The hidden faces of fusion power,” Weinberg Foundation, http://www.the-weinberg-foundation.org/2013/01/28/the-hidden-faces-of-fusion-power/.

Huge government-backed projects like ITER and other state-backed fusion behemoths – for instance the National Ignition Facility in Livermore, Calif. – are impressive in their own right as ambitious science projects. And for variety’s sake, it is reassuring to note that each takes a decidedly different approach: ITER (and South Korea) wants to confine small amounts of superheated fuel contained in a huge space by superconducting magnets, while NIF is compressing its fuel into a tiny cube zapped by nearly 200 lasers that travel almost a mile to their target.

But they are concrete examples of the overriding problem that has afflicted fusion ever since physicists began seriously proposing it in the 1950s: They are a long way away from making fusion a reality. The simple problem with fusion is the amount of energy that it takes to create and sustain a meaningful fusion reaction exceeds the amount of energy captured from the reaction. A British phsycist named Martin Lawson established the conditions to overcome this back in 1955, throwing down a gauntlet known as the Lawson criterion.

The wry joke about fusion is that it is always 30 years away. And if you look at the timelines espoused by ITER, South Kroea and NIF, they all play right into that humor. When I interviewed ITER deputy director Richard Hawryluk a year–and-a-half ago for my Kachan & Co. report on alternative nuclear power, he did not foresee useful, grid-connected fusion power until at least 2040 (I haven’t spoken with him since, but in this field of molasses-like progress, I doubt much has changed).

NIF’s website calls for market penetration in the “2030s and beyond.”  Call me jaded, but given the history of this science as well as recent NIF difficulties noted by the San Francisco Chronicle, and I’ll key in on the “beyond.” In the Chronicle story, one scrutinizing, unnamed Congressional expert said that NIF is still “very, very far away” from its goal.

The Nature story suggest that South Korea could produce a commercial reactor by 2036 – so that’s starting to sound a little sooner than three decades.

Lest I sound dismissive, let me say that NIF, ITER and other colossal projects are making useful scientific findings. And they certainly stand a chance of licking Lawson.

THE FUSION ENTREPRENEURS

But what has gone largely unnoticed in the shadows of these giants is that a number of much smaller, privately held and in some cases venture capital-backed companies are also pursuing fusion. “Small” and “privately held” in no way guarantees that they’ll break through where the big boys keep trodding along but I chose to believe, perhaps with a dash of naiveté, that the entrepreneurial spirit behind them will get at least one or two of the little ones there first.

Each of them is working on considerably smaller fusion contraptions than the 20-story “tokamak” building that will rise at Cadarache and the 10-story tall, 3-football field long facility housing 192 lasers that each zig zag their way nearly a mile to hit a tiny target of hydrogen isotopes in Livermore.

And each (I mention only some below) is developing its own particular take on fusion.

Two of the startups, Tri-Alpha Energy of Irvine, Calif. and Lawrenceville Plasma Physics(LPP) of Middlesex, New Jersey, are working on a technology  called “aneutronic” fusion that directly creates electricity. Other approaches to fusion use the heat of hot neutrons released in the reaction to drive a turbine. Aneutronic fusions tends to use fuel that differs from the deuterium and tritium (both hydrogen isotopes) of “conventional” fusion. Rather, it tends to use regular hydrogen and boron.

One thing that distinguishes LPP is its collaborative approach – it is boldly reaching out to Iran, a world leader in aneutronic fusion research, to jointly develop this peaceful form of nuclear power in an initiative that LPP president Eric Lerner calls Fusion for Peace.

And when I think of what sets Tri-Alpha  - a stealth company – apart from the others, I think of funding. It has received over $140 million in venture funds, including tranches from Goldman Sachs, Venrock, Vulcan Capital New Enterprise Associates, and reportedly from Microsoft co-founder Paul Allen.

FUSION AND THE OIL INDUSTRY

Another fusion startup that has venture backing – about $32 million last time I counted – is General Fusion of Burnaby, Canada, near Vancouver. Its funders include Amazon.com founder CEO Jeff Bezos, through his Bezos Expeditions investment company.

Notably, General Fusion also has backing from a Canadian oil sands company, Cenovus Energy. (Oil interest in fusion is not new. In the 1970s, for example, Exxon Corp. was investigating laser-based fusion). One could imagine a small-sized fusion machine providing the heat or electricity to assist in the extraction of bitumen from the Canadian prairies.

### 1NC—No Resource Wars

#### Resource wars are highly unlikely and never escalate

Salehyan 8—Professor of Political Science at North Texas [Idean, *Journal of Peace Research*, “From Climate Change to Conflict? No Consensus Yet” 45:3, Sage, DOI: 10.1177/0022343308088812]

A few caveats are in order here. It is important to note, again, that the most severe effects of climate change are likely to be felt in the future, and the future is inherently uncertain.4 While fundamental shifts in the environment are not inconceivable, our best bet for predicting what is to come is to look at what has transpired in the past. Since it is frequently argued that climate change will lead to resource scarcities and exacerbate inequality, it is possible to draw upon past evidence regarding these factors to develop a sense of how conflicts might unfold given changes in the Earth’s atmosphere. Additionally, I do not take issue with the claim that climate change will present considerable challenges for human societies and ecosystems more generally. Humanitarian crises stemming, in part, from climate change have the potential to be severe, and steps must be taken quickly to attenuate such contingencies. Rather, my purpose here is to underscore the point that environmental processes, by themselves, cannot explain why, where, and when fighting will occur; rather, the interaction between environmental and political systems is critical for understanding organized armed violence. First, the deterministic view has poor predictive power as to where and when conflicts will break out. For every potential example of an environmental catastrophe or resource shortfall that leads to violence, there are many more counter-examples in which conflict never occurs. But popular accounts typically do not look at the dogs that do not bark. Darfur is frequently cited as a case where desertification led to food scarcity, water scarcity, and famine, in turn leading to civil war and ethnic cleansing.5 Yet, food scarcity and hunger are problems endemic to many countries—particularly in sub-Saharan Africa—but similar problems elsewhere have not led to large-scale violence///

. According to the Food and Agriculture Organization of the United Nations, food shortages and malnutrition affect more than a third of the population in Malawi, Zambia, the Comoros, North Korea, and Tanzania,6 although none of these countries have experienced fullblown civil war and state failure. Hurricanes, coastal flooding, and droughts—which are all likely to intensify as the climate warms—are frequent occurrences which rarely lead to violence. The Asian Tsunami of 2004, although caused by an oceanic earthquake, led to severe loss of life and property, flooding, population displacement, and resource scarcity, but it did not trigger new wars in Southeast Asia. Large-scale migration has the potential to provoke conflict in receiving areas (see Reuveny, 2007; Salehyan & Gleditsch, 2006), yet most migration flows do not lead to conflict, and, in this regard, social integration and citizenship policies are particularly important (Gleditsch, Nordås & Salehyan, 2007). In short, resource scarcity, natural disasters, and long-term climatic shifts are ubiquitous, while armed conflict is rare; therefore, environmental conditions, by themselves, cannot predict violent outbreaks. Second, even if local skirmishes over access to resources arise, these do not always escalate to open warfare and state collapse. While interpersonal violence is more or less common and may intensify under resource pressures, sustained armed conflict on a massive scale is difficult to conduct. Meier, Bond & Bond (2007) show that, under certain circumstances, environmental conditions have led to cattle raiding among pastoralists in East Africa, but these conflicts rarely escalate to sustained violence. Martin (2005) presents evidence from Ethiopia that, while a large refugee influx and population pressures led to localized conflict over natural resources, effective resource management regimes were able to ameliorate these tensions. Both of these studies emphasize the role of local dispute-resolution regimes and institutions—not just the response of central governments—in preventing resource conflicts from spinning out of control. Martin’s analysis also points to the importance of international organizations, notably the UN High Commissioner for Refugees, in implementing effective policies governing refugee camps. Therefore, local hostilities need not escalate to serious armed conflict and can be managed if there is the political will to do so.

## \*\*\* 1NR

### Fusion

**Fusion will never be a practical, cost-competitive source of power.**

Joe **Romm**, 10/9/**2012**. PhD Physics @ MIT, Senior Fellow at American Progress and is the editor of Climate Progress. “NY Times: Funding For Fusion ‘Better Spent On Renewable Sources Of Energy That Are Likely To Be Cheaper And Quicker’” Climate Progress, http://thinkprogress.org/climate/2012/10/09/973021/ny-times-funding-for-fusion-better-spent-on-renewable-sources-of-energy-that-are-likely-to-be-cheaper-and-quicker/.

I am a big proponent of harnessing the power of fusion — from 93 million miles away.

Fusion is done by our sun really, really well and for free. Here on Earth in reactors … not so much. And so the famous saying, “**fusion energy is fifty years away — and always will be.”**

I have never been a big fan of earth-bound fusion, in part because I was an M.I.T. undergrad in October 1983 when Prof. Lawrence Lidsky published his famous critique, “The Trouble With Fusion,” in the MIT-edited magazine, Technology Review, with that unforgettable [cover](http://www.technologyreview.com/magazine/magpdf.aspx?id=424) quoting his devastating conclusion.

What made the critique doubly devastating was that Lidsky was then associate director of the Plasma Fusion Center and editor of the Journal of Fusion Energy! More on Lidsky at the end.

Things haven’t changed much in three decades. Technology Review reported earlier this year, “researchers still say practical fusion power plants remain decades away.”

The New York Times editorialized Sunday on the latest fusion failure, “[A Big Laser Runs Into Trouble](http://www.nytimes.com/2012/10/07/opinion/sunday/a-big-laser-runs-into-trouble.html?partner=rssnyt&emc=rss)“:

After spending more than $5 billion to build and operate a giant laser installation the size of a football stadium, the Energy Department has not achieved its goal of igniting a fusion reaction that could produce energy to generate power or simulate what happens in a nuclear weapon.

The latest deadline for achieving ignition was last Sunday, Sept. 30, the end of fiscal year 2012, but it passed amid mounting concerns that the technical challenges were too great to be mastered on a tight time schedule.

Congress will need to look hard at whether the project should be continued, or scrapped or slowed to help reduce federal spending.

We spend a lot of money on this effort — money that could almost certainly be better spent on forms of carbon-free energy we could actually have a chance of deploying in time to avert catastrophic, irreversible climate change.

As William Broad [reported in The Times](http://www.nytimes.com/2012/09/30/science/fusion-project-faces-a-frugal-congress.html?pagewanted=all) last Sunday, there is a sharp split among experts on whether the project — one of the most expensive federally financed projects ever — is worth the money. Just operating it costs roughly $290 million a year….

If the main goal is to achieve a power source that could replace fossil fuels, we suspect the money would be better spent on renewable sources of energy that are likely to be cheaper and quicker to put into wide use.

Even if ignition is achieved in the laboratory in the next several years, scaling up to a demonstration plant will cost billions and may **ultimately show that fusion is not a practical source of power**.

I was at the Department of Energy when the decision to approve the National Ignition Facility was being made. I can’t say any of the energy analysts thought it a particularly worthwhile investment. I can say non-energy considerations ended up playing a much bigger role in the decision than energy considerations.

Lidsky, who died in 2002, is worth remembering. In the tradition of the best scientists and engineers, he spoke truth to power — in this case what he saw as a largely fruitless, waste of money — at great risk to his career. But then I have never met a scientist who was “in it for the money.” When smart folks want to get rich, they pick a different profession.

In its [obit for Lidsky](http://web.mit.edu/newsoffice/2002/lidsky.html), Technology Review explained what happened to him — and how his main conclusions stood the test of time. Indeed, the first line of the obit raised his famous critique of fusion:

Retired MIT professor Lawrence M. Lidsky of nuclear engineering, who went public with his reservations about the efficacy of fusion as an energy source after devoting his career to its development, died Friday at his home in Newton after a 17-year battle with cancer. He was 66 years old.

Lidsky, a Cornell University graduate whose MIT doctoral thesis in 1962 was titled “Plasma Generation and Acceleration,” was assistant director of the MIT Plasma Fusion Center when he published an article in 1983 titled “The Trouble With Fusion” in MIT’s Technology Review. He wrote the piece, Lidsky said at the time, because “I couldn’t get an internal discussion going. Some didn’t care and some didn’t want to know.” A short time after the article appeared, Lidsky resigned his position at the Plasma Fusion Center. Congress reduced funding for the fusion program by 5 percent the next year. It was renamed the Plasma Science and Fusion Center in December 1997.

“Larry Lidsky was one of the smartest people I ever met,” said Professor Jeffrey P. Freidberg, head of the MIT Department of Nuclear Engineering. “He was often way ahead of his time in delivering insightful and crucial analysis of the prospects of both fusion and fission power. In the fusion area, Professor Lidsky was one of the earliest engineers to point out some of the very, very difficult engineering challenges facing the program and how these challenges would affect the ultimate desirability of fusion energy. As one might imagine, his messages were not always warmly received initially, but **they have nevertheless stood the test of time.”**

Lidsky later became a passionate advocate of the development of meltdown-proof Modular High Temperature Gas Cooled Reactors, which depend upon nuclear fission rather than fusion for their energy.

It’s time to scale back the fusion effort toward very long-term research and use most of the money for emerging carbon-free technologies that hold the prospect of significant contribution to preserving a livable climate while there is still time to do so — energy efficiency and renewable energy (see “[The full global warming solution: How the world can stabilize at 350 to 450 ppm](http://thinkprogress.org/climate/2011/01/10/207320/the-full-global-warming-solution-how-the-world-can-stabilize-at-350-to-450-ppm/)“). Unlike fusion in the past three decades, renewables, especially solar and wind, have seen major technological advances, a steady drop in cost, and major innovations in manufacturing leading to commercial products.

### Ice Age

**Plus there is no cooling.**

**Borenstein 9** (Seth, writer for the Associated Press, “Is the Earth cooling instead of warming? No way, statisticians say,” 10-31, houmatoday.com/apps/pbcs.dll/article?AID=/20091031/articles/910319962&template=printart)

Have you heard that the world is now cooling instead of warming? You may have seen some news reports on the Internet or heard about it from a provocative new book. Only one problem: It's not true, according to an analysis of the numbers done by several **independent statisticians** for The Associated Press. The case that the Earth might be cooling partly stems from recent weather. Last year was cooler than previous years. It's been a while since the super-hot years of 1998 and 2005. So is this a longer climate trend or just weather's normal ups and downs? In a blind test, the AP gave temperature data to four independent statisticians and asked them to look for trends, without telling them what the numbers represented. The experts found no true temperature declines over time. "If you look at the data and sort of cherry-pick a micro-trend within a bigger trend, that technique is particularly suspect," said John Grego, a professor of statistics at the University of South Carolina. Yet the idea that things are cooling has been repeated in opinion columns, a BBC news story posted on the Drudge Report and in a new book by the authors of the best-seller "Freakonomics." Last week, a poll by the Pew Research Center found that only 57 percent of Americans now believe there is strong scientific evidence for global warming, down from 77 percent in 2006. Global warming skeptics base their claims on an unusually hot year in 1998. Since then, they say, temperatures have dropped — thus, a cooling trend. But it's not that simple. Since 1998, temperatures have dipped, soared, fallen again and are now rising once more. Records kept by the British meteorological office and satellite data used by climate skeptics still show 1998 as the hottest year. However, data from the National Oceanic and Atmospheric Administration and NASA show 2005 has topped 1998. Published peer-reviewed scientific research generally cites temperatures measured by ground sensors, which are from NOAA, NASA and the British, more than the satellite data. The recent Internet chatter about cooling led NOAA's climate data center to re-examine its temperature data. It found no cooling trend. "The last 10 years are the warmest 10-year period of the modern record," said NOAA climate monitoring chief Deke Arndt. "Even if you analyze the trend during that 10 years, the trend is actually positive, which means warming." The AP sent expert statisticians NOAA's year-to-year ground temperature changes over 130 years and the 30 years of satellite-measured temperatures preferred by skeptics and gathered by scientists at the University of Alabama in Huntsville. Statisticians who analyzed the data found a distinct decades-long upward trend in the numbers, but could not find a significant drop in the past 10 years in either data set. The ups and downs during the last decade repeat random variability in data as far back as 1880. Saying there's a downward trend since 1998 is **not scientifically legitimate**, said David Peterson, a retired Duke University statistics professor and one of those analyzing the numbers. Identifying a downward trend is a case of "people coming at the data with preconceived notions," said Peterson, author of the book "Why Did They Do That? An Introduction to Forensic Decision Analysis." One prominent skeptic said that to find the cooling trend, the 30 years of satellite temperatures must be used. The satellite data tends to be cooler than the ground data. And key is making sure 1998 is part of the trend, he added. It's what happens within the past 10 years or so, not the overall average, that counts, contends Don Easterbrook, a Western Washington University geology professor and global warming skeptic. "I don't argue with you that the 10-year average for the past 10 years is higher than the previous 10 years," said Easterbrook, who has self-published some of his research. "We started the cooling trend after 1998. You're going to get a different line depending on which year you choose. "Should not the actual temperature be higher now than it was in 1998?" Easterbrook asked. "We can play the numbers games." That's the problem, some of the statisticians said. Grego produced three charts to show how choosing a starting date can alter perceptions. Using the skeptics' satellite data beginning in 1998, there is a "mild downward trend," he said. But doing that is "deceptive." The trend disappears if the analysis starts in 1997. And it trends upward if you begin in 1999, he said. Apart from the conflicting data analyses is the eyebrow-raising new book title from Steven D. Levitt and Stephen J. Dubner, "Super Freakonomics: Global Cooling, Patriotic Prostitutes and Why Suicide Bombers Should Buy Life Insurance." A line in the book says: "Then there's this little-discussed fact about global warming: While the drumbeat of doom has grown louder over the past several years, the average global temperature during that time has in fact decreased." That led to a sharp rebuke from the Union of Concerned Scientists, which said the book mischaracterizes climate science with "distorted statistics." Levitt, a University of Chicago economist, said he does not believe there is a cooling trend. He said the line was just an attempt to note the irony of a cool couple of years at a time of intense discussion of global warming. Levitt said he did not do any statistical analysis of temperatures, but "eyeballed" the numbers and noticed 2005 was hotter than the last couple of years. Levitt said the "cooling" reference in the book title refers more to ideas about trying to cool the Earth artificially. Statisticians say that in sizing up climate change, it's important to look at moving averages of about 10 years. They compare the average of 1999-2008 to the average of 2000-2009. In all data sets, 10-year moving averages have been higher in the last five years than in any previous years. "To talk about global cooling at the end of the hottest decade the planet has experienced in many thousands of years is **ridiculous**," said Ken Caldeira, a climate scientist at the Carnegie Institution at Stanford. Ben Santer, a climate scientist at the Department of Energy's Lawrence Livermore National Lab, called it "a concerted strategy to obfuscate and generate confusion in the minds of the public and policymakers" ahead of international climate talks in December in Copenhagen. President Barack Obama weighed in on the topic Friday at MIT. He said some opponents "make cynical claims that contradict the overwhelming scientific evidence when it comes to climate change — claims whose only purpose is to defeat or delay the change that we know is necessary." Earlier this year, climate scientists in two peer-reviewed publications statistically analyzed recent years' temperatures against claims of cooling and found them not valid. Not all skeptical scientists make the flat-out cooling argument. "It pretty much depends on when you start," wrote John Christy, the Alabama atmospheric scientist who collects the satellite data that skeptics use. He said in an e-mail that looking back 31 years, temperatures have gone up nearly three-quarters of a degree Fahrenheit (four-tenths of a degree Celsius). The last dozen years have been flat, and temperatures over the last eight years have declined a bit, he wrote. Oceans, which take longer to heat up and longer to cool, greatly influence short-term weather, causing temperatures to rise and fall temporarily on top of the overall steady warming trend, scientists say. The biggest example of that is El Nino. El Nino, a temporary warming of part of the Pacific Ocean, usually spikes global temperatures, scientists say. The two recent warm years, both 1998 and 2005, were El Nino years. The flip side of El Nino is La Nina, which lowers temperatures. A La Nina bloomed last year and temperatures slipped a bit, but 2008 was still the ninth hottest in 130 years of NOAA records. Of the 10 hottest years recorded by NOAA, eight have occurred since 2000, and after this year it will be nine because this year is on track to be the sixth-warmest on record. The current El Nino is forecast to get stronger, probably pushing global temperatures even higher next year, scientists say. NASA climate scientist Gavin Schmidt predicts 2010 may break a record, so a cooling trend "will be never talked about again."

### Overview

**Immigration reform key to stem graduates**

**Holen 09** - Senior fellow @ Technology Policy Institute [Arlene Holen (Former associate director of the Congressional Budget Office and holds an MA in economics from Columbia University), “The Budgetary Effects of High-Skilled Immigration Reform,” Technology Policy Institute, March 2009]

Although economists hold different views on the economic effects of immigration in general, they are virtually unanimous in their belief that admitting more highly skilled workers, particularly in STEM fields (science, technology, engineering, and mathematics), is beneficial to the U.S. economy (see e.g., Mankiw 2008). High-skilled immigration promotes technological entrepreneurship, economic growth, and productivity. It is less well understood that immigration—especially high-skilled immigration—has beneficial fiscal effects at the federal and also possibly the state and local levels (see e.g., Lee and Miller 2000). This paper examines the economic effects of high-skilled immigration and its effects on the federal budget. Its purpose is to provide data and analysis to help inform the immigration policy debate. Constraints on Admissions in Current Law The current annual cap on green cards for skilled workers is 40,000 and there is a five-year backlog of applications. (There are separate caps of 40,000 for priority workers with extraordinary ability and also for professionals holding advanced degrees.) Per-country caps further limit admissions, especially of applications from China and India. The result of these constraints is that many high-skilled workers in scientific and technical fields who are currently working in the United States on temporary H-1B visas are forced to leave their jobs each year and return home. Similarly, many foreign students completing scientific and technical training at U.S. colleges and universities who would otherwise remain and work in the United States are returning to their home countries, taking their U.S.-acquired human capital with them. This loss of human resources imposes significant costs on the U.S. economy and constitutes a drain on federal revenues. Pg. 3-4 //1ac

**Best data.**

**Stuen et al. 10** – Professor of economics @ University of Idaho [ERIC T. STUEN, AHMED MUSHFIQ MOBARAK (Professor of Economics @ University of Colorado, Boulder) & KEITH E.MASKUS (professor @ Yale School of Management), “SKILLED IMMIGRATION AND INNOVATION: EVIDENCE FROM ENROLLMENT FLUCTUATIONS IN U.S. DOCTORAL PROGRAMS,” National Bureau of Economic Research, January 2010]

Research scientists in American universities continue to argue strongly that their **ability to develop knowledge, raise grants, and ultimately expand technology-based innovation** depends on unimpeded access to the highest-caliber graduate students they can attract from anywhere in the world. This claim is intuitively plausible but before now has not been tested carefully with micro data. In the absence of such a test such claims could legitimately be criticized for potentially mixing cause and effect: perhaps the rise in both research productivity and numbers and share of international doctoral students were simply coincident or caused by other factors. In any event these arguments have not resulted in changes in basic immigration policy with respect to foreign graduate students. Thus, our purpose here was to assess the causal role of domestic and international doctoral students in the production of S&E knowledge. Using **detailed data** on the national origins of students, on academic research output, and exogenous variation in student – department matches, **we demonstrate the existence of such causal effects**. Both domestic and foreign students significantly increase the numbers of publications and citations in U.S. S&E departments. The contribution of international candidates is much larger, however. These results suggest that a 10% reduction in the foreign-student share would have reduced citations and publications by 5-6% in the average department over our time period. Interestingly, this difference in productivity emerged only in the second half of our sample. Moreover, international students are particularly beneficial in generating highly cited research at elite American universities. Two further significant results emerged from this analysis. First, any macroeconomic shocks abroad that differentially reduce the ability of higher quality (scholarship) students to come to the United States substantially reduce the research output contributions of foreign doctoral candidates. Second, the most powerful impact of all appears to come from enrolling a greater regional diversity of students, holding constant the total number of graduate students. A 10% increase in diversity leads to a 10% rise in both publications and citations. Further, it appears that diversity is the primary mechanism driving the research contributions of doctoral students, rather than nationality *per se*. These last two findings are of particular significance in practical terms. First, that **the** **quality of international students has a significant impact** at the margin implies that U.S. student-visa policy may be misguided if an important objective is to expand the research capacity of American universities. Rather than relying largely on a demonstration of financial wealth sufficient to support graduate study, an additional key criterion for issuing a visa could be indicators of student quality (easily measured by admission to top-ranked programs or winning scholarships) independent of assets or incomes. Second, that diversity is important could be a useful criterion for S&E departments in determining their admission decisions. Greater disparity of origins generates more research productivity, though this benefit must be weighed against any implied coordination costs associated with potential language difficulties. Pg. 30-32 //1ac

### UQ

#### Getting the bill introduced now is key to passage—fights now will cause Obama to introduce his own bill tanking chances of passage

Moss 3/28—the New American [March 28, 2013, Warren Mass, “Obama Predicts Immigration Bill Passage by Summer,” http://www.thenewamerican.com/usnews/immigration/item/14939-obama-predicts-immigration-bill-passage-by-summer]

In interviews with two Spanish-language television networks on March 27, President Obama expressed optimism that immigration reform legislation being drafted by the bipartisan “Gang of Eight” group of senators will be passed this summer.

Fox News cited the president’s statement that he is still prepared to step in with his own bill if talks among the senators break down, but he doesn't expect that intervention to be necessary.

"If we have a bill introduced at the beginning of next month as these senators indicate it will be, then I'm confident that we can get it done certainly before the end of the summer," Obama told Hialeah, Florida-based Telemundo (the second-largest Spanish-language network in the United States).

Observers attribute Obama’s hand-off to Congress to draft an immigration reform package as being part of the White House political strategy. Fox notes that Obama “and his advisers have calculated that a bill crafted by Capitol Hill stands a better chance of winning Republican support than one overtly influenced by the president.”

ABC News quoted from Obama’s interview with Doral, Florida-based Univision (which has the largest audience of Spanish-language television viewers in the world according to Nielsen): "I'm actually optimistic that when they get back they will introduce a bill," said Obama. "My sense is that they have come close and my expectation is that we'll actually see a bill on the floor of the Senate next month."

Obama was unwilling to commit to taking action of his own if members of Congress fail to introduce an immigration bill in April, replying, "I'm not going to presuppose that they don't [reach an agreement].”

#### Immigration will pass—Obama is pushing. Includes High-Skilled Visas

IMASSERA 3—26—13 http://www.imassera.com/obama-urges-congress-to-restart-immigration-talks/2420307/

President Obama got the new week off to a fast start by prodding congressional negotiators, from both parties, to get to work at once in order to reach a plan that would finally overhaul the nation’s immigration laws.

The Commander-in-Chief essentially demanded that a new immigration bill emerge soon from the halls of Congress so that its merits can be debated publicly in the Senate.

According to President Obama, now is the time to fix the system which he claimed has been broken for years.

The President and members of Congress have stated that they expect a new bill to be introduced in early April right after members return from their two week Easter vacations.

The new bill, when introduced, is likely to include a thirteen year road to full citizenship for the country’s millions of illegal aliens.

It is also supposed to include visas for high tech workers that allow them to stay in the United States for a longer period of time. There will also be a section in the bill that eliminates visas for extended families.

The legislation is expected to receive strong bipartisan support.

#### Capital will win votes for immigration.

The Hill 3/15/13 [Obama support group off to sluggish start, http://thehill.com/homenews/administration/288305-obama-support-group-off-to-sluggish-start]

Obama sees the group as having the potential to reverse a pivotal mistake from his first term, when Obama feels he failed to harness the enthusiasm of his campaign to promote his policy agenda.

There’s some worry the window for OFA’s success might have already begun to close.

With slipping popularity and congressional Republicans retrenching for another round of budget fights, Obama’s once bountiful post-election political capital is being gradually depleted.

But OFA supporters argued that rather than being derailed by the political circumstances, the group was the answer to the problem.

Ben LaBolt, a spokesman for the Obama campaign who led one of the summit’s seminars, noted Thursday that “more than one million Americans have already taken action through OFA to urge members of Congress to support comprehensive immigration reform, gun safety measures, and policies that will strengthen the middle class.”

President Obama told the group that their efforts “may give space here in Washington to do the kind of work — hopefully bipartisan work — that's required.”

"This is what inside Washington doesn't get about outside Washington,” said the former administration official. “They're thinking about this strictly in terms of process. But it's about how you engage these folks. If you went on and knocked on doors because you're into climate change, you're going to do it on an off year.”

A Democratic operative also argued that the group’s nonprofit status—which prevents it from explicitly partisan, electoral activity—would actually aid the group in its mission to forward the president’s agenda.

“Four years ago we tried to construct OFA as an organization with dual missions -- electing Democrats and passing the president’s policies -- and we may have bit off more than we could chew,” he said. “There's ample need for an organization wholly dedicated to passing this ambitious agenda.”

Even donors who acknowledged the group was off to a slow start predicted that just as the campaign heated up, so will OFA.

"When the president really starts to push these issues like immigration, that's when you're going to see this operation going at full speed,” said one top Obama donor. “This is why people elected the president. It wasn't necessarily about him but what he could do."

#### AND—more warrants

#### A. House & Senate obstacles falling—avoiding unforeseen issues key

PBS News 3/21/13 http://www.pbs.org/newshour/rundown/2013/03/progress-on-immigration-reform-leaves-leading-advocate-elated-wary.html

Rep. Luis Gutierrez, D-Ill., center at the podium, has long advocated for the comprehensive immigration reform. In November 2012, the representative stood with members of the Congressional Hispanic Caucus and announced a declaration of nine principles for comprehensive immigration reform. Photo courtesy of Rep. Luis Gutierrez/Flickr.

This week, the Republican National Committee, Sen. Rand Paul, R-Ky. and Speaker of the House John Boehner all have endorsed bipartisan work in Congress toward comprehensive immigration reform legislation.

But Rep. Luis Gutierrez, D-Ill., still worries.

"I'm not sleeping because I'm thinking about what [more] needs to be done," said the 10-term Democratic congressman from Chicago. "There are other more nefarious forces out there."

Gutierrez has made securing a path to citizenship for the estimated 11 million undocumented residents living in the U.S. -- most of them Hispanic -- a personal mission. Now that he's closer than ever to the goal, he's not letting up on his image as a tireless, vocal firebrand widely considered the preeminent voice for immigration reform in Congress.

He's led rallies against the deportation policies of President Barack Obama and challenged Mr. Obama and Democratic leaders who support immigration reform to push harder and faster for a comprehensive bill.

But Gutierrez now says the November election may have done for the cause what all his years of hectoring the political class could not.

"I said this before the election. Everybody said, what's going to change, Luis? What's going to change if we vote for Barack Obama? All these deportations, people getting arrested," Gutierrez said in an interview with PBS NewsHour. "I remember saying, oh, I'm working for Obama. I'm gonna make sure he gets elected because the victory is going to be so huge he's going to be indebted to Latinos."

Latinos voted overwhelmingly for the president and other Democrats, and that changed the calculus of Republicans as well, Gutierrez said. "That vote was so huge and numerous that Republicans, who had always wanted to either take this [immigration reform] off the table or -- many more -- who were our allies, our partners" could now support comprehensive reform, he said.

Working closely with Republicans, as he did several years ago during the last run at comprehensive immigration reform, Gutierrez is part of a small group in Congress quietly fashioning a bill. It's allowed the liberal former Chicago city council member to forge new bonds despite ideological differences.

"There are a lot of wonderful personal relationships that are being developed across the aisle between people who politically have nothing else in common, who come to this issue, this 'public policy matter,' [they] you would say, so that it would be drained of any emotion, right?—from a different perspective. I see it as a civil rights issue, as a human rights issue," Gutierrez said.

As the economic, political, and practical advantages of immigration reform get voiced by both parties, he believes potential obstacles to passing a final bill continue to fall away. And he says he's less worried than before about one such pitfall -- the demand by some conservatives that undocumented residents not be allowed to become U.S. citizens but only legalized residents. "I start from the premise that never again will we allow America to let there be a permanent second-class anything. We had a civil war over that," Gutierrez said. "We're not going to revisit it now. We're not gonna allow a permanent subclass of Americans."

Predictions are that immigration bills in the House and Senate will be unveiled formally after next week's Spring congressional recess. Legislation could arrive on the president's desk before summer's end.

But some advocates worry something they can't see now, such as the grassroots "anti-amnesty" movement that scuttled public opinion support for a law six years ago, could arise again.

Gutierrez says it's what keeps him from sleeping well.

#### B. despite skepticism and disagreements

IBT 3/22/13—International Business Tribune [http://www.ibtimes.com/immigration-reform-bill-suddenly-close-what-made-republicans-change-their-minds-1145763]

When President Barack Obama called on Congress to send him an immigration bill “in the next few months” during his 2013 State of the Union address in January, many were skeptical that it would actually happen.

By now it’s a tired trope that the obstructionist tactics of Republican legislators have left Washington sclerotic, all but unable to address many of the issues facing America as Obama begins his second term in the White House.

But immigration reform is turning out to be one area of policy where action is happening, and experts on the issue say that a landmark law will likely be on the books by the end of this summer.

“People want to get this done well before the August recess, and people are talking about before July 4,” David Koelsch, an attorney and law professor who runs the Immigration Law Clinic at the University of Detroit Mercy, said. “A signing ceremony on the Fourth of July looks really good, there’s nice optics around that.”

It’s almost shocking at this point to see members of Congress from both sides of the aisle coming together to support a groundbreaking piece of important legislation.

But that’s what’s happening as even Tea Party-backed Republicans like Senator Rand Paul of Kentucky are coming into the fold and endorsing a path to citizenship and other pillars of what is shaping up to be the framework for comprehensive immigration reform.

There are still some differences between even the most centrist members of Congress that must be ironed out, but in most cases they are disagreements of scale and specifics, and a consensus about what to include in the bill is taking shape.

**Hirsh (PC)**

**2. Obama’s working behind the scenes—here’s academic support**

**BECKMANN & KUMAR 11—Professor of Political Science, UC, Irvine** [Matthew N. Beckmann and Vimal Kumar, How presidents push, when presidents win: A model of positive presidential power in US lawmaking, Journal of Theoretical Politics 2011 23: 3

Fortunately for those inside the West Wing, some researchers paint a more optimistic picture regarding presidents’ potential for passing important planks of their legislative agenda. Covington et al. (1995), Barrett and Eshbaugh-Soha (2007), Edwards III and Barrett (2000), Kellerman (1984), Light (1982), Peterson (1990), and Rudalevige (2002) all observe that presidents secure greater support for their ‘priority’ items, and when they exert ‘effort’ pushing them. In addition, Covington (1987) concludes that White House officials can occasionally win greater support among legislators by **working behind the scenes**, while Canes-Wrone (2001, 2005) shows that presidents can induce support from a recalcitrant Congress by strategically ‘going public’ when advocating popular proposals (see also Kernell (1993)). Sullivan (1987, 1988) finds that presidents can amass winning congressional coalitions by changing members’ positions as a bill moves through the legislative process.

However, even among these relative optimists, the prescription for presidents appears to be an ephemeral combination of luck and effort, not a systematic strategy. In discussing the challenge for a president looking to push legislation on Capitol Hill, Samuel Kernell offers a comparable assessment. He writes, The number and variety of choices place great demands upon [presidents’] strategic calculation, so much so that pluralist leadership must be understood as an art…an ability to sense ‘right choices’. (Kernell, 1993: 36) Furthermore, the seemingly paradoxical findings noted above, that is, a general (if modest) pattern of president-supported legislative success on passage and policy content, but not on ‘key’ roll-call votes, remain unexplained.

This paper aims to demystify the White House’s legislative strategies, both their logic and their effects. Developing a non-cooperative game in which the president allocates **scarce ‘political capital’ to induce changes in legislators’ behavior**, we deduce two lobbying strategies White House officials may execute and, in turn, investigate their impact on the laws that result. Interestingly, we theorize that presidents’ foremost influence comes from bargaining with congressional leaders over policy alternatives before bills reach the floor, not bargaining with pivotal voters for their support once they do. Precisely because so much of the presidents’ influence **comes in the legislative earlygame** (rather than the endgame), we theorize that typical roll-call-based tests of presidents’ legislative influence have missed most of it.

**A. Insiders believe it’s true—so it de-facto is**

**Schier 11—Dorothy H. and Edward C. Congdon Professor of Political Science at Carleton College** [Steven E. Schier, The Contemporary Presidency: The Presidential Authority Problem and the Political Power Trap, Presidential Studies Quarterly, Volume 41, Issue 4, pages 793–808, December 2011]

The concept of political capital captures many of the aspects of a president's political authority. Paul Light defines several components of political capital: party support of the president in Congress, public approval of the president's conduct of his job, the president's electoral margin, and patronage appointments (Light 1999, 15). Light derived this list from the observations of 126 White House staff members he interviewed (1999, 14). His indicators have two central uses. First, Light's research reveals that they are central to the “players' perspective” in Washington. That is, **those “in the game” view these items as crucial for presidential effectiveness**. Second, they relate to many central aspects of political authority as defined by Skowronek. So on both theoretical and practical levels, the components of political capital are central to the fate of presidencies. The data here will reveal that presidents over the last 70 years have suffered from a trend of declining levels of political capital, a trend that is at the heart of their political authority problem.

Many scholars have examined particular aspects of presidential political capital, from congressional support (for example, Bond and Fleisher 1992, 2000; Mayhew 2005; Peterson 1993) to job approval (Brace and Hinckley 1991; Kernell 1978; Nicholson Segura and Woods 2002). From these, we know that presidential job approval is influenced by economic performance, tends to drop over time, and that divided government can boost job approval. Also, job approval and control of Congress by fellow partisans boosts presidential success in floor votes but does not produce more important legislation than does periods of divided government. These “micro” findings, however, comport with a “macro trend” of declining presidential political capital over time. This analysis explores that macro trend and relates it to previous micro findings.

**B. Losing capital hurts**

**BECKMANN & KUMAR 11 Professor of Political Science, UC, Irvine** [Matthew N. Beckmann and Vimal Kumar, How presidents push, when presidents win: A model of positive presidential power in US lawmaking, Journal of Theoretical Politics 2011 23: 3

Before developing presidents’ lobbying options for building winning coalitions on Capitol Hill, it is instructive to consider cases where the president has no political capital and no viable lobbying options. In such circumstances of imposed passivity (beyond offering a proposal), a president’s fate is clear: his proposals are subject to pivotal voters’ preferences. So if a president lacking political capital proposes to change some far-off status quo, that is, one on the opposite side of the median or otherwise pivotal voter, a (Condorcet) winner always exists, and it **coincides with the pivot’s predisposition** (Brady and Volden, 1998; Krehbiel, 1998) (see also Black (1948) and Downs (1957)). Considering that there tends to be substantial ideological distance between presidents and pivotal voters, positive presidential influence without lobbying, then, is not much influence at all.11

**5. Hirsh admits the agenda sometimes works that way**

**Hirsh 12** [12/14/12, Michael Hirsh, Obama Gets a Solution to His Susan Rice Problem, http://www.nationaljournal.com/whitehouse/obama-gets-a-solution-to-his-susan-rice-problem-20121213]

It was a classic Washington exit: stealthy and swift, with few fingerprints. President Obama didn’t want to be seen as backing down. So Susan Rice — one of his most devoted aides since 2007 — gave him the way out, seemingly all on her own.

“If nominated, I am now convinced that the confirmation process would be lengthy, disruptive, and costly — to you and to our most pressing national and international priorities,” Rice wrote on Thursday in a letter withdrawing her name from consideration as secretary of State.

In a statement in response, Obama said that “while I deeply regret the unfair and misleading attacks on Susan Rice in recent weeks,” he “accepted her decision.” He added that Rice will continue as his U.N. ambassador for the time being.

This was all the part intended for public consumption. The underlying reality is this: The president is almost certainly furious about this turn of events — which represents the first major defeat he’s suffered since his reelection — but he’s a savvy enough politician to know how to back off without seeming to back down. While floating Rice’s name for secretary of State in the media was always something of a trial balloon — she was never formally nominated or even publicly declared by the administration to be the leading candidate to replace Hillary Rodham Clinton — Obama appeared to really want to appoint her, calling her “extraordinary” and excoriating GOP attacks on her with unusual (for him) personal pique.

But as the weeks passed, it became clearer that Rice’s biggest political problem was no longer just the klatch of Republican senators, led by John McCain, who were fiercely criticizing her for allegedly misleading statements on the attack at the U.S. consulate that killed U.S. Ambassador Christopher Stevens and three other Americans in Benghazi, Libya on Sept. 11.

After a series of strikingly unsuccessful meetings on Capitol Hill in which she failed to impress even moderate Republicans such as Susan Collins of Maine, Rice also found herself facing resistance from foreign-policy elites who questioned her temperament and her record. In addition, human-rights critics were up in arms over her behavior toward African dictators, particularly her role in allegedly holding up publication of a U.N. report that concluded the government of Rwandan President Paul Kagame, with whom she has a long and close relationship, was supplying and financing a brutal Congolese rebel force known as the M23 Movement.

That may have been the tipping point, though an official on Rice's team declined to say so. As she put it herself in her letter to Obama, the president had some other “pressing national international priorities.… It is far more important that we devote precious legislative hours and energy to enacting your core goals, **including comprehensive immigration reform**, balanced deficit reduction, job creation, and maintaining a robust national defense and effective U.S. global leadership.”

In other words, the Obama team was quickly coming to realize that, even though it appeared he had considerable leverage over the Republicans following a more-robust-than-thought reelection victory, a Rice nomination was simply going to cost him too much political capital, especially when it came to a long-term budget deal.

**6. Other’s reading of that article to support PC finite**

**Fournier 2/8/13—National Journal Staff** [Ron Fournier, http://www.nationaljournal.com/politics/stung-by-media-s-focus-on-liberal-agenda-obama-pivots-back-to-economy-20130208]

“He needs to get back to jobs, jobs and middle-class jobs,” the Democrat said, speaking on condition of anonymity to avoid retribution from the White House.

Regardless of his approval ratings, there are limits to Obama’s political capital, as Michael Hirsh explained in this week’s National Journal magazine. I have been questioning the limits of a presidential mandate since Election Day. But the White House is confident that Obama has the upper hand against a GOP that is significantly less popular than the Democratic Party, according to polls.

### Hirsh (WW)

#### Winners Lose & capital is finite—can’t replenish

Beckmann & Kumar 11—Professor of Political Science, UC, Irvine [Matthew N. Beckmann and Vimal Kumar, How presidents push, when presidents win: A model of positive presidential power in US lawmaking, *Journal of Theoretical Politics* 2011 23: 3]

As with all lobbyists, presidents looking to push legislation must do so indirectly by pushing the lawmakers whom they need to pass it. Or, as Richard Nesustadt artfully explained:

The essence of a President’s persuasive task, with congressmen and everybody else, is to induce them to believe that what he wants of them is what their own appraisal of their own responsibilities requires them to do in their interest, not his…Persuasion deals in the coin of self-interest with men who have some freedom to reject what they find counterfeit. (Neustadt, 1990: 40) Fortunately for contemporary presidents, today’s White House affords its occupants an unrivaled supply of persuasive carrots and sticks. Beyond the office’s unique visibility and prestige, among both citizens and their representatives in Congress, presidents may also sway lawmakers by using their discretion in budgeting and/or rulemaking, unique fundraising and campaigning capacity, control over executive and judicial nominations, veto power, or numerous other options under the chief executive’s control. Plainly, when it comes to the arm-twisting, brow-beating, and horse-trading that so often characterizes legislative battles, modern presidents are uniquely well equipped for the fight. In the following we employ the omnibus concept of ‘presidential political capital’ to capture this conception of presidents’ positive power as persuasive bargaining.1 Specifically, we define presidents’ political capital as the class of tactics White House officials employ to induce changes in lawmakers’ behavior.2 Importantly, this conception of presidents’ positive power as persuasive bargaining not only meshes with previous scholarship on lobbying (see, e.g., Austen-Smith and Wright (1994), Groseclose and Snyder (1996), Krehbiel (1998: ch. 7), and Snyder (1991)), but also presidential practice.3 For example, Goodwin recounts how President Lyndon Johnson routinely allocated ‘rewards’ to ‘cooperative’ members:

The rewards themselves (and the withholding of rewards) . . . might be something as unobtrusive as receiving an invitation to join the President in a walk around the White House grounds, knowing that pictures of the event would be sent to hometown newspapers . . . [or something as pointed as] public works projects, military bases, educational research grants, poverty projects, appointments of local men to national commissions, the granting of pardons, and more. (Goodwin, 1991: 237)

Of course, presidential political capital is a scarce commodity with a floating value. Even a favorably situated president enjoys only a finite supply of political capital; he can only promise or pressure so much. What is more, this capital ebbs and flows as realities and/or perceptions change. So, similarly to Edwards (1989), we believe presidents’ bargaining resources cannot fundamentally alter legislators’ predispositions, but rather operate ‘at the margins’ of US lawmaking, however important those margins may be (see also Bond and Fleisher (1990), Peterson (1990), Kingdon (1989), Jones (1994), and Rudalevige (2002)). Indeed, our aim is to explicate those margins and show how presidents may systematically influence them.

#### Health care and climate prove winners don’t win

Lashof 10—director of the National Resource Defense Council's climate center, Ph.D. from the Energy and Resources Group at UC-Berkeley (Dan, “Coulda, Shoulda, Woulda: Lessons from Senate Climate Fail.” NRDC Switchboard Blog, http://switchboard.nrdc.org/blogs/dlashof/coulda\_shoulda\_woulda\_lessons.html)

Lesson 2: Political capital is not necessarily a renewable resource.

Perhaps the most fateful decision the Obama administration made early on was to move healthcare reform before energy and climate legislation. I’m sure this seemed like a good idea at the time. Healthcare reform was popular, was seen as an issue that the public cared about on a personal level, and was expected to unite Democrats from all regions. White House officials and Congressional leaders reassured environmentalists with their theory that success breeds success. A quick victory on healthcare reform would renew Obama’s political capital, some of which had to be spent early on to push the economic stimulus bill through Congress with no Republican help. Healthcare reform was eventually enacted, but only after an exhausting battle that eroded public support, drained political capital and created the Tea Party movement. Public support for healthcare reform is slowly rebounding as some of the early benefits kick in and people realize that the forecasted Armageddon is not happening. But this is occurring too slowly to rebuild Obama’s political capital in time to help push climate legislation across the finish line.

**Yes PC**

**Honeymoon isn’t over—small data sampling—still has momentum**

**Sullivan 3/8/13—covers national politics for “The Fix.” Former Editor of Hotline On Call, National Journal Hotline’s politics blog.** [Sean Sullivan, http://www.washingtonpost.com/blogs/the-fix/wp/2013/03/08/why-its-too-early-to-declare-the-end-of-obamas-post-election-honeymoon/]

Why it’s too soon to declare the end of Obama’s post-election honeymoon

Polling data released in recent days suggested that President Obama’s post-election honeymoon may well have come to an end. But a review of a wide cross-section of polling conducted over the last few months suggests it’s **too early** to declare Obama the honeymoon over just yet.

Here’s the bottom line: There are data points that should worry the president and his top advisers. But across the board, his numbers haven’t exactly dive-bombed.

There are two polls that that have shown signs of trouble for the president:

\* Obama’s approval rating (45 percent) in a Quinnipiac University survey released Thursday was virtually unchanged from his approval rating a month ago (46 percent). But it is down from early December, when 53 percent of voters approved of the job the president was doing, a month after his re-election win.

\* According to Gallup, which tracks Obama’s approval rating among Americans based on a three-day rolling average, Obama’s number is now hovering around the high 40s, down from the low 50s where it stood in the months leading up to last week’s failure to avert the deep federal spending cuts known as sequestration.

How do those numbers stack up against the rest of the post-election polling that has been conducted? Obama’s job approval rating hasn’t dropped as severely in other surveys:

So what does this all suggest? A couple of things. For starters, we need to see more post-sequestration polling numbers (the cuts kicked into effect last weekend) to get a better sense of what the cuts ultimately mean for Obama’s political standing. Second, Obama’s hasn’t lost all of the momentum he picked up post-election. While the president has been embroiled in high-profile fiscal standoffs with Congressional Republicans, the **fights haven’t done serious damage to his brand.**

It’s important to note that the outcome of the first fiscal battle, over the fiscal cliff, turned out much better for Obama than the second one, over sequestration. He largely got what he wanted in the deal to avert the cliff, as Republicans agreed to tax hikes on the wealthiest Americans. But on sequestration, Republicans didn’t cave into his demands for a mix of new tax revenues and alternate spending cuts — and much of the post-sequester coverage has focused on how Obama’s warnings haven’t come true.

Aside from Obama’s approval rating, there is some data that suggest signs of trouble for Obama coming out of the sequestration standoff. A CBS News poll showed nearly as many Americans blamed him (33 percent) as blamed Congressional Republicans (38 percent) for failure to avert the cuts. And last month’s NBC News/Wall Street Journal poll found only 32 percent said the country is headed in right direction, down from 41 percent in December.

As the Fix boss wrote in this space about a month ago, the lengths of post-reelection political honeymoons have grown shorter and shorter in recent years (Gallup has a comprehensive study here). Obama, who has a very ambitious legislative agenda right now, is hoping to be the exception to that trend. We’ll find out in the coming months if he can pull that off or not.

### AT: Guns

#### Guns don’t thump immigration

Kayyem 1/21 [Juliette, columnist for Boston Globe, Action on guns and immigration needed, http://bostonglobe.com/opinion/2013/01/21/president-obama-has-opportunities-guns-immigration/uRCngtyVOuJ51De55A8HyK/story.html]

Neither immigration nor gun control had a significant place in Obama’s first-term agenda. Indeed, at their core, both are public safety programs — messy and dark and generally removed from the “hope” that got him to the White House. But in the span of a few weeks, the 2012 presidential election and the massacre at Newtown, Conn., provided the impetus for a renewed push for both comprehensive immigration reform and comprehensive gun controls. The question now is whether the White House can do both, and that has proponents of immigration reform very anxious. Pro-immigration forces had the president’s ear in November. Hispanics are now over 10 percent of the total electorate, twice as big a portion as just 20 years ago, and they gave Obama over 70 percent of their votes. But then all those children were killed in Newtown, and immigration reform became a lesser priority. The moral obligation to address gun violence fell quickly on Obama and Vice President Joe Biden. Their announcement last week of sweeping legislative and administrative changes was driven by a near-universal revulsion at what happened in Connecticut. A CBS News/New York Times poll released last Thursday showed that, among Democrats, 93 percent support background check for gun purchasers; among Republicans, it’s 89 percent. These numbers are more than a mandate; they make some kind of change a foregone conclusion. The political reality today is that immigration reform and gun control can occur simultaneously, because they are being driven by different forces. This is hopeful news for those who believe we should be judged as a nation both by how we treat our newest citizens and protect our youngest ones. With Republicans now eager to engage in a discussion on immigration reform, to undo some of the damage of their past resistance, Obama can leave much of the impetus for immigration to the red states and promote gun control via the blue ones. The last part is already happening: Massachusetts Governor Deval Patrick, Maryland Governor Martin O’Malley, and New York Governor Andrew Cuomo either are pushing, or have already passed, state legislation in tandem with the White House’s gun-control effort. Democrats in conservative states, like Senator Mary Landrieu of Louisiana and Majority Leader Harry Reid of Nevada, will need the White House to stay engaged on gun control, if only to provide them with cover. Meanwhile, as Republicans become more recalcitrant on gun control — and the lunacy of the NRA’s media campaign continues — they will need to find an issue that makes them seem kinder and gentler. Enter immigration reform. The Republicans know that their future rests on embracing a more diverse electorate. They need immigration reform as much as it needs them. This pressure is felt most acutely by state-level Republican leaders aiming for 2016, such as Louisiana Governor Bobby Jindal.

**Economy**

**No fiscal thumpers—immigration central focus—bipart key**

**USA TODAY 3/22/13** http://www.usatoday.com/story/news/politics/2013/03/21/budget-congress-recess-immigration-guns/2006219/

A brief reprieve in the fiscal battles between President Obama and a divided Congress will allow two contentious and politically divisive domestic issues — guns and immigration — to take center stage in the national debate this spring.

The ability for Washington to find solutions to either issue will require the kind of bipartisan cooperation and common ground the president and congressional leaders have been unable to find on the budget.

In other words: It won't be easy.

The push to strengthen the nation's gun laws has been fueled by public pressure for legislative action in the wake of the Sandy Hook Elementary School massacre in Newtown, Conn., that left 20 schoolchildren and six educators dead.

Renewed interest in overhauling the nation's immigration laws, and how or whether to create a path to citizenship for about 11 million undocumented residents, was sparked after the election in 2012 saw Hispanic voters siding with Obama over the GOP by 3-to-1.

Congress will turn to both issues this spring after approving competing budget resolutions and a short-term spending bill this week to avert a government shutdown through Sept. 30. The action temporarily lessens the intensity of the two-year-plus fiscal drama with President Obama until mid- to late summer, when Congress will have to again vote on increasing the debt ceiling, the nation's borrowing authority.

**OBD**

**Means the AFF is conditional since it could pass at any time. Voting issue.**

**NAACP 7** National Association for the Advancement of Colored People

(Washington Bureau Fact Sheet: “What happens to bills when the Congress ends?”, http://www.naacp.org/pdfs/Advocacy\_Tools.pdf)

A very small number of bills introduced actually become law. In the 107th Congress, which ran from 2001 to 2002, 8,948 bills were introduced in the US House and Senate. Of these, 377 laws were enacted. This means that just over 4% of the bills introduced in the 107th Congress actually became law. In the United States, a “Congress” or congressional term lasts two years. Most recently, the 108th Congress began on January 7, 2003, and will adjourn before the end of 2004. Each Congress is comprised of two sessions; the first session, which encompasses the first year, and the second session, which is comprised of the second year. At any point when Congress is in session, a sitting member of Congress may introduce legislation: members of the House of Representatives introduce bills in the House and Senators introduce bills in the Senate. This legislation can cover almost any issue conceivable. Once a bill has been introduced, it is alive and may be considered at any time during the Congress. Once a Congress adjourns, however, at the end of its two-year cycle, all bills that have been introduced in either the House or the Senate that have not made it through the entire legislative process and signed into law are dead. This includes bills that may have passed both the House and the Senate but were never finalized and sent to the President for his signature; bills that passed one house (either the House or the Senate) but not the other; bills that were the subject of committee or subcommittee hearings but were never considered by either house; and bills that never got more action after being introduced.