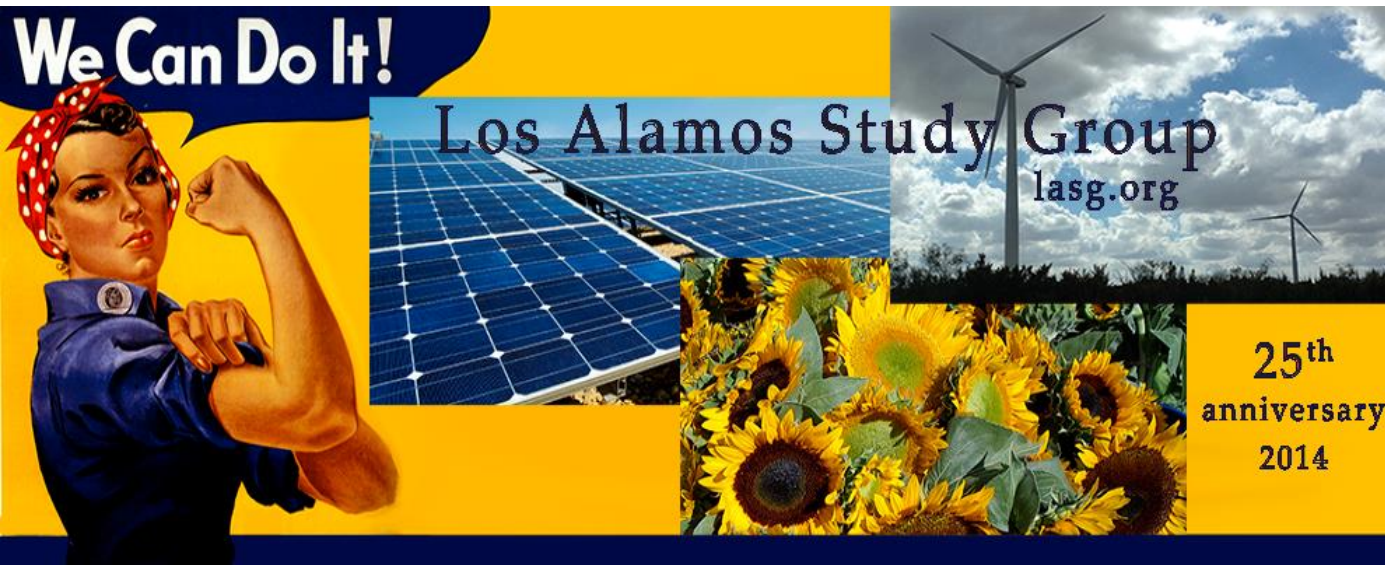


Nuclear issues update from the Los Alamos Study Group, plus a framework for evaluating New Mexico energy and climate proposals

Greg Mello, Los Alamos Study Group, 11/26/2018

Now, more than ever, technological, social, and political interdependence urgently calls for an ethic of solidarity..., which encourages peoples to work together for a more secure world, and a future that is increasingly rooted in moral values and responsibility on a global scale.

Pope Francis, message to Humanitarian Impact of Nuclear Weapons Conference, Vienna, 2014



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What is the purpose of our life in this world? Why are we here? What is the goal of our work and all our efforts? What need does the earth have of us? It is no longer enough, then, simply to state that we should be concerned with future generations. We need to see that what is at stake is our own dignity. Leaving an inhabitable planet to future generations is, first and foremost, up to us. The issue is one which dramatically affects us, for it has to do with the ultimate meaning of our earthly sojourn....our inability to think seriously about future generations is linked to our inability to broaden the scope of our present interests.

Encyclical of Pope Francis, "*Laudato Si: On Care of Our Common Home*"

November 26, 2018

Los Alamos Study Group, 505-265-1200, lasg.org

Why this talk?

- The Los Alamos Study Group seeks interns, volunteers – and, potentially, paid staff. We see the present circumstance as especially propitious – as well as perilous. If you think you might be interested, talk to us. We will be working across issues and on nuclear weapons policy in particular, here and in Washington, DC.
- We respect 350.org – the overall goals, the deep knowledge, the enthusiasm and commitment, and we want to open a discussion with you about normative energy and climate policies – tonight, just the *evaluative frame* in which we might evaluate such policies.
- I have been seriously engaged in environmental policy off and on since 1970. Speaking from this experience, I am increasingly concerned that Democratic Party leaders, who now hold a great deal of power in the State, will inadvertently misdirect and hold back our nascent energy transition, change little or nothing of importance in our society, and do essentially nothing to strengthen our social contract, increase our resilience, or mitigate the deadly climate change in which we find ourselves. I fear the core narratives being advanced by many well-meaning people are wrong, divisive, and certain to fail – for the same reasons they have failed up to now.
- We want to convey to you that we are faced with an holocaustic emergency, in which every person has an important role to play. What we read about the climate emergency in UN and US reports is understated.
- We want to enlist your help in starting to eliminate some of the “tribalism” and party spirit that is afflicting many of our Democratic Party friends, not just on this and other particular subjects but as a mindset overall.

A few elements of evaluative framework I am proposing (I):

- Making rapid strides, within 4 years, toward lower greenhouse gas (GHG) emissions (not just carbon).
- Making our communities more resilient – economically, socially, in self-governance, morally and spiritually. To solve the climate problem we must solve the social problem, the economic problem, the governance problem, the moral problem. **Either we mend the social contract and environmental contract together, or we will fail to mend either. We must solve more than the climate problem, to solve the climate problem. The former enables the latter.**
- In our climate and energy policies we must opt for what the Catholic Church has called the “preferential option for the poor and vulnerable.” *Nota bene*, children and young people are by definition vulnerable. Protection of the vulnerable is the very essence of the social contract and a, if not the, source of legitimacy for government. The powerful, by definition, do not need our help. The climate movement in the US has failed in great part because powerful polluters have weaponized the poor, and the angry, against us who would save the climate. In doing so they tap into a far more socially-fundamental, widely-recognized, moral narrative, against which the environmental community will always lose. We must listen, with greater respect and identification, to deplorable voices. Like Pulitzer, we aspire to “comfort the afflicted and afflict the [too] comfortable.”
- Creating tangible social and economic results within a realistic political window, i.e. 2 years. We need to create thousands of jobs and train thousands of people in a wide variety of work related to RE, EE, EC, sustainable transport (ST), sustainable agriculture (SA), ecosystem services of all kinds, training, analysis, organizing, resistance.

A few elements of evaluative framework I am proposing (II) (abridged due to time):

- Communicating, with our bodies and words, that our society will not maintain its present affluence and cannot do so. What it can and must do is to provide greater equality of opportunity and respect.
- To maximize opportunity we need to have locally-planned, -built, -managed, -owned, and -used RE, where “locally” can mean on-site, in-community, in-city, –town, -county, -tribe, or –state, depending. We must appropriately *localize* and honor *subsidiarity*. If NM is, in the end, just a flat, sunny or windy place from which energy can be “mined,” it will do no good to this state or any other. Why? Because the way of life into which that energy would be exported is *otherwise* unsustainable, unjust, undemocratic, and doomed. The Empire – of this country over other ones, and of Man over the living Earth – is failing. We are eating others alive.
- It will not be possible to adopt anywhere near a 100% RE supply at our present consumption level. The Mark Jacobson analysis is very flawed. Ted Trainer is far closer to the truth of the matter, and has been for 30 years. I lived for years at 10% of modern US energy use and perhaps you have as well. Trish and I have cut back ~ 50%, though not to that earlier level. We could. So could you.
- Greater firmness and resolution. We need to rebel, to physically halt business-as-usual. The Extinction Rebellion is a good start.
- We need to ditch identity politics, which is long past its sell-by date.
- Our economy is already shrinking by some measures and this will get much worse. Capital is and will be scarce. We can't do everything and won't.

[Nuclear weapons background material omitted.]

US nuclear weapons modernization plan (Obama + Trump); as of April 2018

Delivery Platform	Program	First Production ²	Completion ²
Ballistic Missile Submarine (SSBN)	Trident D-5 SLBM LEP ¹	2015?	2023
	Columbia Class submarine	2021	2040
	New SLBM	2035	2045
	W76-1 LEP	2008	2019
	W88 alterations	2020	2024
	W76-2 LEP (low-yield; new in 2018 NPR; not approved)	2020?	2021?
ICBM/ GBSD	New ballistic missile	2024	2035
	Infrastructure & communications	2025	2033
	W87 alterations	2021	2027
	W78 LEP	2030	2043
Long Range Bomber	B-21 bomber	2022	2034
	LRSO cruise missile	2026	2036
	W80-4 LEP (for LRSO)	2025	2032
Dual-Capable Aircraft (DCA)	F-35A Block 4 certification	2020	n/a
	B61 tail kit	2018	2021
	B61-12 LEP (replaces B61-3, 4, 7, & 10)	2020	2024
	B61-13 (replaces B61-12)	late 2040s	late 2050s
Naval platform(s)	SLCM (the missile)	New in 2018 NPR; not approved by Congress yet	
	SLCM (the warhead)		
(GBSD + SLBM)	Interoperable warheads (IWs)	Now only "studies" since 2018 NPR	

LEP = Life Extension Program

Dates are US fiscal years.

Programs may be delayed.

Nov 2018 note: IW1 is now "W78 LEP" or "W87-1." Current program requires new pit.

Trump additions/subtractions in red.

Does not include specialized factories for nuclear weapon components made of special nuclear materials. For example, the US aims to invest billions of dollars in one or possibly two factories for the production of plutonium warhead cores ("pits"). Existing usable pits, of which there are approximately 10,000 to 13,000 including those in deployed, reserved, and retired warheads, will last past 2063-2089, 85-100 years from the year of manufacture. Large investments are also underway for uranium and lithium components as well as for tritium production.

Table 2-1.

Projected Costs of U.S. Nuclear Forces, by Department and Function, 2017 to 2046

Billions of 2017 Dollars

	DoD	DOE	Total
Nuclear Delivery Systems and Weapons			
Strategic nuclear delivery systems and weapons			
Ballistic missile submarines	275	38	313
Intercontinental ballistic missiles	124	25	149
Bombers ^a	245	20	266
Other nuclear activities ^b	44	n.a.	44
Subtotal	688	84	772
Tactical nuclear delivery systems and weapons	18	7	25
Nuclear weapons laboratories and supporting activities	n.a.	261	261
Total, Nuclear Delivery Systems and Weapons	706	352	1,058
Command, Control, Communications, and Early-Warning Systems ^c	184	n.a.	184
Total Estimated Costs of Nuclear Forces	890	352	1,242

Source: Congressional Budget Office, using information from the Department of Defense and the Department of Energy.

Total estimated costs are the costs to field, operate, and sustain the current generation of nuclear forces, as well as the costs to develop, field, operate, and sustain the next generation of systems. The costs reflect CBO's projections of the Department of Defense's and the Department of Energy's budgets, CBO's estimates of cost growth based on historical experience with similar programs, and CBO's estimates of the costs of major modernization programs.

DoD = Department of Defense; DOE = Department of Energy; n.a. = not applicable.

a. Cost estimates include 100 percent of the costs of all nuclear-capable bombers, although they also have a conventional (nonnuclear) mission.

In previous studies, CBO attempted to capture the nuclear portion of the mission by counting only 25 percent of the costs of the B-52 and B-21 bombers. Using that accounting, the total cost of bombers would be \$127 billion and the total costs of nuclear forces would be \$1.1 trillion.

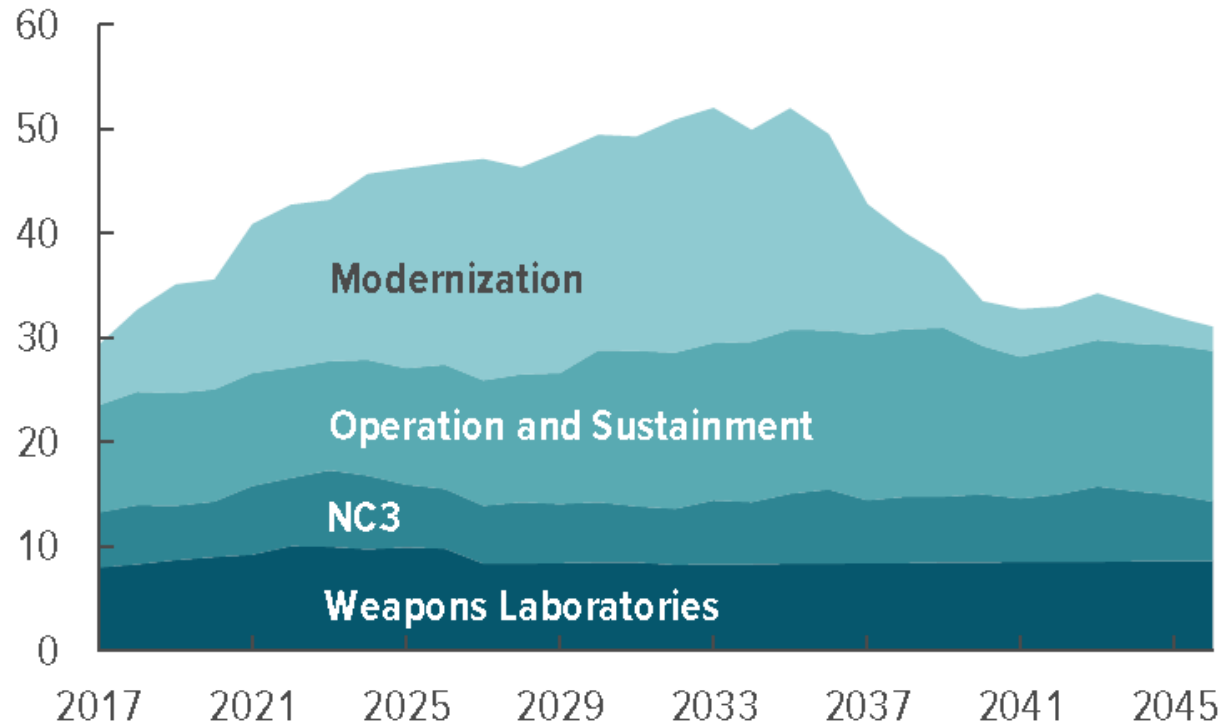
b. This category includes DoD's nuclear-related research and operation and support activities that CBO was not able to associate with a specific type of delivery system or weapon.

c. Estimates for modernization plans for this category are based on programs already delineated in budget documents. If additional modernization programs were needed, actual costs would be higher.

Summary Figure 1.

Costs of Nuclear Forces Under the 2017 Plan, 2017 to 2046

Billions of 2017 Dollars



Source: Congressional Budget Office, using data from the Department of Defense and the Department of Energy.

NC3 = Nuclear command, control, communications, and early-warning systems.

The Pit

- The pit is composed of materials that allow mechanical energy to be converted to electromagnetic energy
- Fabrication processes used are typical of any metal fabrication facility:
 - Casting
 - Forming
 - Machining
 - Welding
- Some of the materials used in pits include:
 - Plutonium
 - Uranium
 - Stainless Steel
 - Beryllium
 - Titanium
 - Aluminum

3. Realities of the LANL site: why LANL in particular can't do industrial plutonium

It will be very difficult or impossible for LANL to establish industrial plutonium missions, especially industrial pit production at any scale, for a multitude of reasons, all of which are largely independent of senior management. These factors are negatively synergistic in ways proven to be difficult to predict or prevent.

- The site's industrial, cultural, and educational isolation, which increases costs and creates program risks;
- LANL's dissected topography, which dramatically increases costs and places firm limits on construction;
- LANL's R&D culture and identity, necessary to protect in order to attract young scientists and engineers, especially given LANL's isolated location; LANL's identity is not one of a high-hazard industrial facility;
- LANL's culture of grandiosity, arrogance, and entitlement, a product of LANL's nuclear weapons mission and its lack of accountability, its secrecy, its isolation, its relatively high formal educational attainment, its large salaries and generous benefits, and locally, its relatively low taxes, splendid local government finance and therefore excellent schools and much else of genuine community accomplishment and value relative to its New Mexico surround; the point is that LANL's culture is one where "delusional optimism" (Flyvbjerg, op. cit.) and "normal accidents" have thrived, for fundamental reasons;
- The unconsolidated sediments that underlie TA-55 and other LANL sites, which together with the site's considerable seismicity (next bullet) increase costs and limit construction options;

Why LANL in particular can't do industrial pits or plutonium, continued

- LANL's high seismicity, a problem that is amplified by known active on-site faults and hence possible ground rupture, the shallow location and high acceleration of earthquakes from them, seismic amplification from unconsolidated sediments, and the structural incompetence of all the rock at LANL;
- LANL's legacy nuclear facilities, which were built for R&D and of limited size; most of these will soon (relative to this long mission) be at, or are already past, their reliable, safe, and useful lives; these include PF-4, the Main Shops, and Sigma, all of which are to have greater or lesser roles in pit production; tearing these facilities down will also be disruptive to a greater or lesser extent.
- The concatenation of difficulties and strain on various LANL support systems posed by multiple industrial plutonium missions at PF-4 (pit production, PuO₂, Pu-238); the challenge of the RLUOB-NLUOB conversion;
- A political environment conducive to corruption, partly of LANL's own making as we see in the case of the Regional Coalition of LANL Communities (RCLC), again contributing to a lack of accountability;
- A very high incidence of drug use and associated crime linked to systemic poverty and inequality (“the aura of apartheid”) in the region;
- The relative lack of a qualified regional workforce and the relative lack of post-secondary educational and vocational institutions in the region;
- The reality of prior, living Pueblo traditions and religious claims to “LANL” lands and waters; and
- The incompatibility of industrial plutonium operations with powerful local cultural aspirations and values.

What have House Democrats said they want, or might want, in nuclear policy?

Democrats, House (and Senate) – some of them – have variously said they would like to, or have taken some action to:

- Block or ban W76-2 low-yield Trident and/or other low-yield warheads (but not including B61-12) (*Dems likely serious, probably will be successful in part because this is a tiny, short-duration program without a single capital line item*)
- Block or delay Long Range Stand Off (LRSO) missile and warhead (W80-4) (*Once serious, Dems may have given up; hard for Dem hawks to decide to stop this missile when Russian cruise missiles are so impressive – one or two generations ahead, depending*)
- No first use declaration (NFU) (*Dems not serious or substantive*)
- Consult with Congress before using nuclear weapons (*Dems not serious or substantive; posturing*)
- Kill, delay, downsize, [and/or eliminate re-MIRV option for] GBSD; [close 1 or more of 3 GBSD bases] [go to 1 warhead type instead of two] [conduct simple LEP for W78 without new pit] (*Smith may be serious; non italicized options will be very hard; if HASC Dems are serious they can gradually win by attacking in multiple simultaneous ways, setting traps; good politics and on merits.*)
- Cut arsenal, NOS (“not otherwise specified”) (*Dems not serious or substantive until specific; Smith of WA will not cut subs, IMO*)
- Provide more congressional oversight, NOS (*Dems not serious or substantive until specific*)
- Block or delay SLCM (*Navy reportedly slow-walking and not interested; Dems might be serious – will see*)
- Save INF (*may be serious for some, but Dems are split; courts Logan Act violations; conflicts with Democratic Party “Russia is evil” narrative going toward 2020 elections*)
- Block INF-violating missile R&D (*goes with previous; many Dems will want work on such missiles even as they pillory Trump*)
- Preserve New START (*Dems serious? Yes, but will require abandoning contradictory stances regarding missile defense, Russophobia; plus Russia will decide for itself and may need a real incentive given overall US aggressive activities*)
- (Interesting: Rep. Adam Smith, HASC incoming Chair, his #3 of 4 aims: “Protecting environmental laws and advancing green energy”)

They are nearly silent on these topics: pit factories, IW-1/W78-1/W87-1 redesign and new pit, other special nuclear factories, weapons labs and plants, NNSA budget waste, deterrence, etc. It will be hard for Dems to become serious but it is possible.

In closing, published comments on a New Mexican editorial about the Governor-Elect as a “climate hawk”:

Alas these tepid commitments are, so far, more "show" than "go." As quoted here, the governor-elect is a POTENTIAL climate hawk. She will need help, and fast, from we in the NGO community, who have our own hot air and denial a-plenty. The key to bipartisan buy-in is probably the design and elucidation of clear economic benefits for households, businesses, and the fiscal health of the state. All of us have our work cut out for us. In the meantime we all need to understand that state policy won't be enough, just as federal policy won't be. We have to work locally and creatively, in government and out. Sacrifice and a kind of divine, creative madness, if you will, is needed. We need to get out of our own way. Collapse of our way of life is now certain -- though nobody knows the "how" and the "when" and "how much", though the "who" is always and forever the vulnerable and the poor -- but our attitudes and efforts, and the solidarity and joy we bring, are under our own control. We are going to have to set aside the liberal ego in favor of some old-fashioned ideas and loves, and open ourselves to greater "verticality" in our worldview [i.e. a moral and spiritual renewal, ala [Solzhenitsyn 1978](#)]. And as ever we must fashion policies with the most vulnerable in mind. Renewable energy, unless it is locally owned, built, managed, arising within our own communities with social goals uppermost, will not help New Mexico. Neither will policies that do not gently close the wrong doors while opening others. This editorial is of a piece with the climate denial that the recently-elected Democrats bring to office. We need to wake from that.