U.S. DEPARTMENT OF ENERGY | Office of Science

Accelerator R&D Stewardship

U. S. Department of Energy
Office of Science
Office of High Energy Physics

Summer 2013

Contacts: Eric.Colby@Science.DOE.GOV , Michael.Zisman@Science.DOE.GOV

Outline

- **What are the origin and motivation for Accelerator R&D Stewardship?**
- **What IS “Accelerator R&D Stewardship”?**
- **How will the program start?**
- **What is the longer-term vision?**
- **How can you engage?**

2009: Accelerators for America's Future Workshop

U.S. DEPARTMENT OF ENERGY
Office of Science

Welcome to All!

Accelerators for America's Future Symposium and Workshop

October 26-28, 2009
Washington, D.C.

Dennis Kovar
Associate Director of the Office of Science for High Energy Physics

U.S. DEPARTMENT OF ENERGY
Office of Science

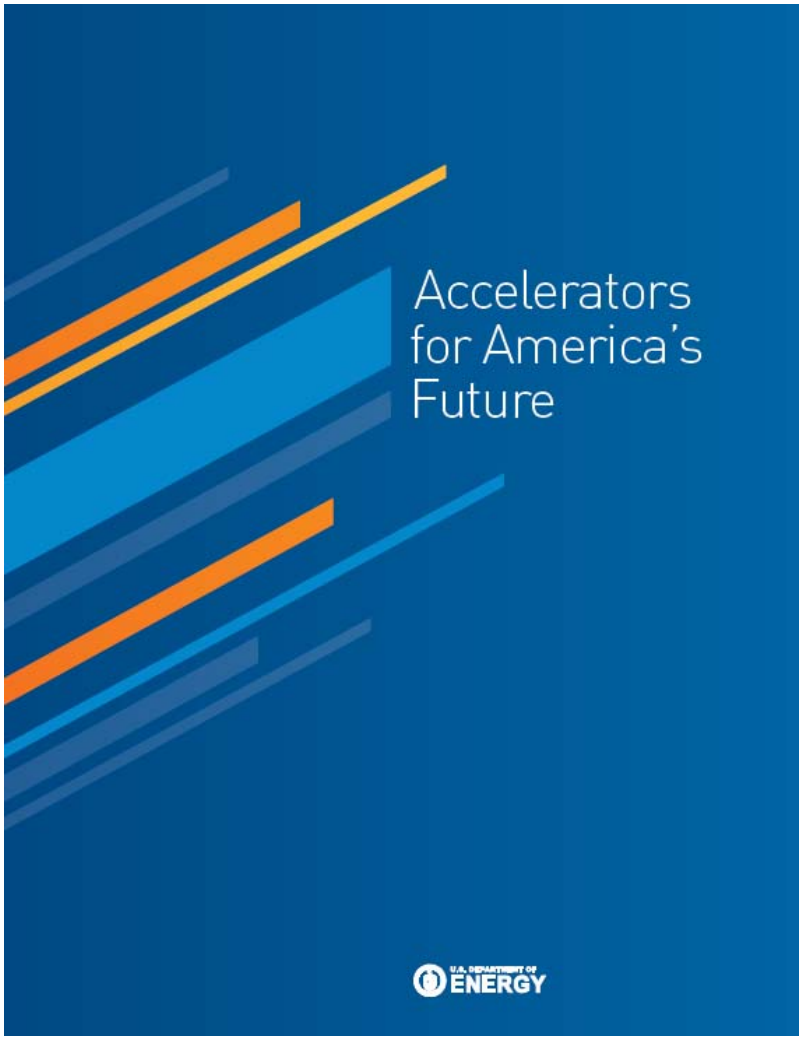
The Charge

- **The Office of High Energy Physics asked Walter Henning and Charles Shank (co-chairs) to propose a mechanism for collecting the information and generating a report that**
  - **identify current and future needs of stakeholders**
  - **seek out crosscutting challenges—technical, cost, policy—whose solutions may have transformative impacts on opportunities for the future**
  - **identify the areas of accelerator R&D that hold greatest promise**
  - **provide guidance to bridge the gap between basic accelerator research and technology deployment**

Across all areas that utilize particle accelerators:

- **Discovery Science**
- **Medicine and Biology**
- **Energy and Environment**
- **National Security**
- **Industrial Applications and Production**

2010: Accelerators for America's Future Report



Identified the importance of accelerator technologies to sectors of the US economy

- "…advocated [for] the creation of large-scale **demonstration and development facilities to help bridge the gap** between development and deployment of accelerator technologies"
- "…called for **greatly improved** interagency, interprogram, and industry-agency **coordination**."
- "…strongly highlighted the value of expanded **training and education** of accelerator scientists and engineers…"

Areas of R&D identified by each working group. All areas are of importance to each working group. Color coding indicates areas with greatest impact.

R&D Need	Energy & Environment	Medicine	Industry	Security & Defense	Discovery Science
Reliability					
Beam Power/RF					
Beam Transport and Control					
Efficiency					
Gradient (SRF and other)					
Reduced Production Costs					
Simulation					
Lasers					
Size					
Superconducting Magnets					
Targetry					
Particle Sources					

Color code: Increased priority

http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Report.pdf

2011: Senate Requests 10-Year Plan for Accelerator R&D Stewardship

Accelerators for America's Future
Workshop: October 2009
Report: June 2010

http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Report.pdf

"The Committee directs the Department to submit a …

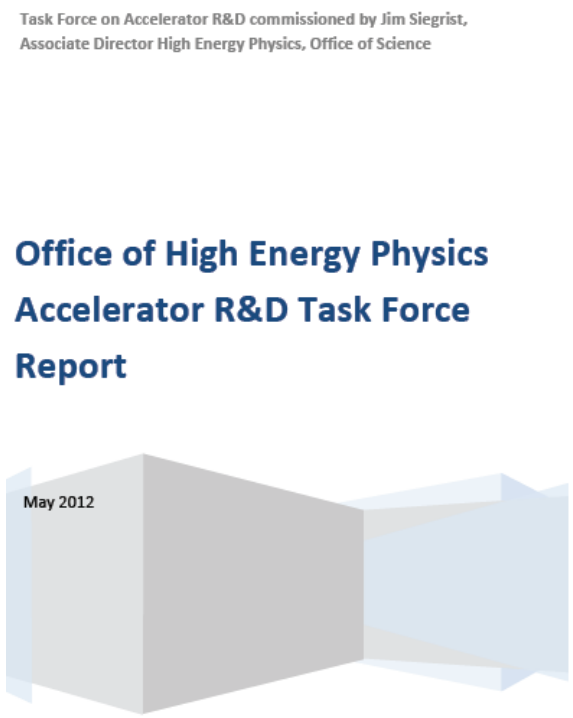
10-year strategic plan … for accelerator technology research and development to advance accelerator applications in energy and the environment, medicine, industry, national security, and discovery science.

The strategic plan should be based on the results of the Department's 2010 workshop study, Accelerators for America's Future, …"

Senate Report 112-075, p. 93. (Ordered to be printed September 7, 2011)

2012: Holtkamp Accelerator R&D Task Force Report

The follow-on to *Accelerators for America's Future*



Accelerator R&D Task Force Report
May 2012

http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Accelerator_Task_Force_Report.pdf

To prepare for creating an accelerator R&D stewardship strategic plan, Dr. Jim Siegrist, Associate Director of Science for High Energy Physics, in consultation with other SC Associate Directors, asked SLAC National Accelerator Laboratory to convene a community task force, chaired by Dr. Norbert Holtkamp from SLAC, to provide information that would:

1. **Identify research opportunities** that might have strong potential for broad national benefits
2. **Summarize the status** of key research and technology areas identified
3. **Identify possible impediments** (both technical and otherwise) to successful accelerator R&D stewardship activities for the broad user base envisioned

May 2013: In recent news…

May 2, 2013

FYI: The AIP Bulletin of Science Policy News

A publication of the American Institute of Physics

Number 80: May 2, 2013

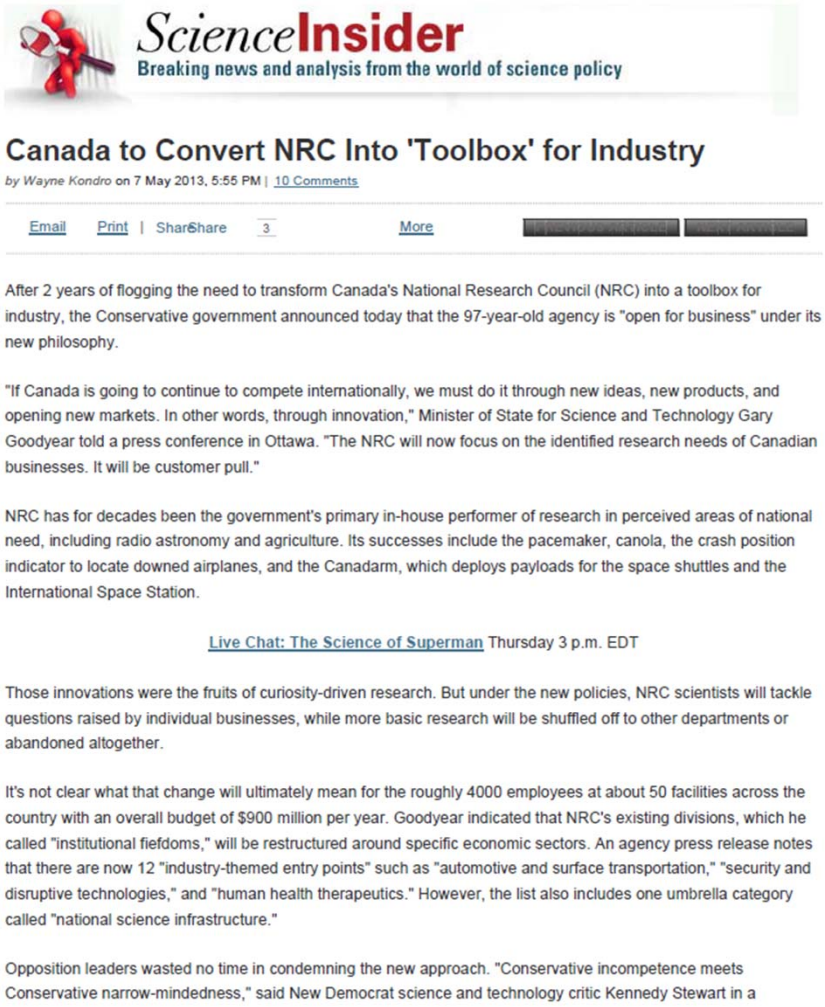
hearing) is two and one-half pages long. A key section of the "High Quality Research Act" states:

> (a) "CERTIFICATION.—Prior to making an award of any contract or grant funding for a scientific research project, the Director of the National Science Foundation shall publish a statement on the public website of the Foundation that certifies that the research project—
>
> > (1) is in the interests of the United States to advance the national health, prosperity, or welfare, and to secure the national defense by promoting the progress of science;
> >
> > (2) is the finest quality, is ground breaking, and answers questions or solves problems that are of utmost importance to society at large; and
> >
> > (3) is not duplicative of other research projects being funded by the Foundation or other Federal science agencies."

Other provisions permit transfer of unobligated funds from unqualified to qualified projects, a required implementation report, and a report by the National Science Board of 'its findings and recommendations on how the [above] requirements of subsection (a) are being

May 2013: In recent news…

May 7, 2013



ScienceInsider
Breaking news and analysis from the world of science policy

Canada to Convert NRC Into 'Toolbox' for Industry

by Wayne Kondro on 7 May 2013, 5:55 PM | 10 Comments

Email Print | Share Share 3 More

After 2 years of flogging the need to transform Canada's National Research Council (NRC) into a toolbox for industry, the Conservative government announced today that the 97-year-old agency is "open for business" under its new philosophy.

"If Canada is going to continue to compete internationally, we must do it through new ideas, new products, and opening new markets. In other words, through innovation," Minister of State for Science and Technology Gary Goodyear told a press conference in Ottawa. "The NRC will now focus on the identified research needs of Canadian businesses. It will be customer pull."

NRC has for decades been the government's primary in-house performer of research in perceived areas of national need, including radio astronomy and agriculture. Its successes include the pacemaker, canola, the crash position indicator to locate downed airplanes, and the Canadarm, which deploys payloads for the space shuttles and the International Space Station.

Live Chat: The Science of Superman Thursday 3 p.m. EDT

Those innovations were the fruits of curiosity-driven research. But under the new policies, NRC scientists will tackle questions raised by individual businesses, while more basic research will be shuffled off to other departments or abandoned altogether.

It's not clear what that change will ultimately mean for the roughly 4000 employees at about 50 facilities across the country with an overall budget of $900 million per year. Goodyear indicated that NRC's existing divisions, which he called "institutional fiefdoms," will be restructured around specific economic sectors. An agency press release notes that there are now 12 "industry-themed entry points" such as "automotive and surface transportation," "security and disruptive technologies," and "human health therapeutics." However, the list also includes one umbrella category called "national science infrastructure."

Opposition leaders wasted no time in condemning the new approach. "Conservative incompetence meets Conservative narrow-mindedness," said New Democrat science and technology critic Kennedy Stewart in a

- "…under the new policies, [National Research Council] scientists will tackle questions raised by individual businesses, while more basic research will be shuffled off to other departments or abandoned altogether."
- "…NRC's existing divisions, which [Minister Goodyear] called "institutional fiefdoms", will be restructured around specific economic sectors."

http://news.sciencemag.org/scienceinsider/, accessed 6/20/2013.

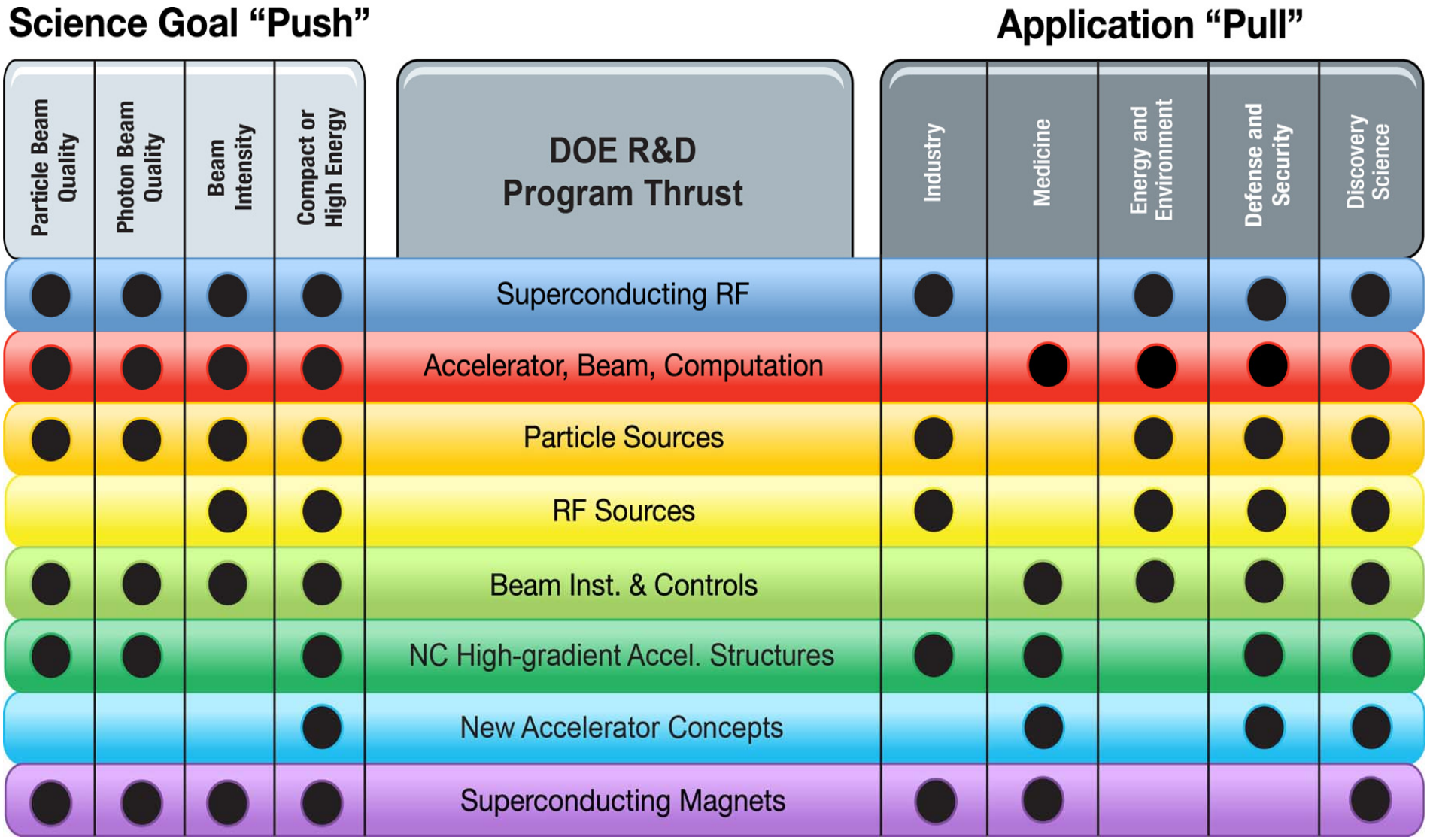
Elements of Accelerator R&D Stewardship

- **Accelerator R&D develops basic science and technologies needed to design, build, and operate state-of-the-art accelerators**
  - accelerators are essential for making new discoveries in HEP
  - **and** for serving a broader community
    - discovery science
    - industry
    - medicine
    - defense and security
    - energy and environment

⇒ Stewardship

- **There is already a strong connection between current R&D thrusts and stewardship program needs**

Connecting Accelerator R&D to Science and to End-User Needs



2012: Mission of Accelerator Stewardship

- **Mission: to support fundamental accelerator science and technology development of relevance to many fields and to disseminate accelerator knowledge and training to the broad community of accelerator users and providers.**

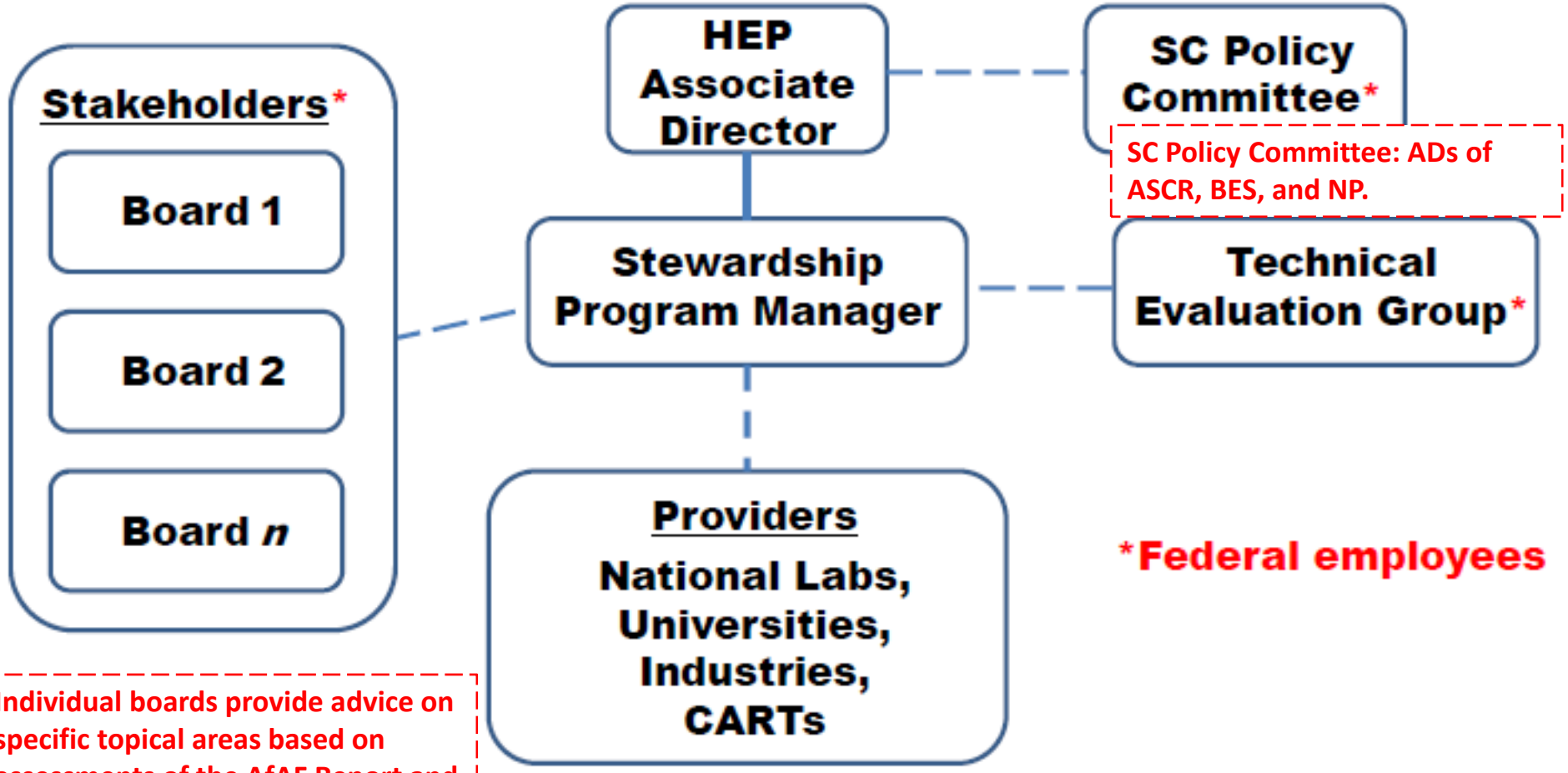
- **Carrying out this new mission (in addition to carrying out the present HEP programmatic R&D effort) will be accomplished through:**

  - **Facilitating access to** national laboratory accelerator **facilities** and infrastructure for **both industrial and other U.S. government agency users/developers** of accelerators and related technology

  - Working with accelerator user communities and industrial accelerator providers to **develop innovative solutions to critical problems**, to the benefit of **both the broader user communities and the DOE discovery science community**

  - Serving as a catalyst **to broaden and strengthen the community** that relies on accelerators and accelerator technology

Schematic of Proposed Program Organization



Programmatic Elements of Stewardship

- Immediately augment existing programs to provide opportunities for industrial and other federally funded users at DOE facilities by increasing support staff and funding for test facilities.
  - 2012: Completed survey of available national lab infrastructure and capabilities
  - 2013: Fall Meeting on Accelerator R&D Stewardship Activities at test facilities
- In the mid-term (2–5 years), identify a few topical areas with high impact for focused work. Anticipated areas are: (1) improved particle beam delivery and control for cancer therapy facilities; and (2) laser development addressing the needs of the accelerator community, i.e., high peak power, high average power, and high electrical efficiency; and (3) energy-efficient power sources for accelerators. Each topical area will have a stakeholder board.
- In the longer term (5–10 years), select additional topical areas for focused work. New stakeholder boards will be created as topics are identified.
- In steady state, SC/HEP goal is to support at least three topical areas at any given time.

2012: Facility Survey Results

- **In addition to broad expertise in accelerator and component design, specialized infrastructure exists**
- **Lab infrastructure falls mainly into these categories:**
  - Beam test facilities
    - electrons, neutrons, protons, light and heavy ions
    - includes particle sources, transport lines, diagnostics, laser-driven accelerators
  - Superconducting cable/strand and cavity preparation and testing facilities
    - cabling equipment, heat treatment ovens, clean rooms
    - Cavity polishing, chemistry, test dewars, etc.
  - Magnet test facilities
    - power supplies, cryogenic test stands, field mapping
  - RF test facilities
    - RF power sources, cryogenic test stands, processing capabilities, clean rooms
  - High-performance computing expertise
    - includes finite-element calculations, general accelerator design, nonlinear beam dynamics and beam transport, radiation shielding, electromagnetic modeling
  - Fabrication and materials characterization facilities
    - high accuracy NC machine tools, CMMs, e-beam welders, wire EDM, chemical cleaning, electro-polishing, SEMs, laser trackers, coating systems, remote handling,…

2013: Next Steps for Opening Lab Test Facilities

- **Inventory available accelerator facilities and competencies**
  - Each lab is asked to present a 20-minute synopsis of facility capabilities and availability
- **Discuss prospective stewardship uses for accelerator facilities**
  - Each lab is asked to present a 15-minute synopsis of potential user requests for facilities.
- **Discuss current business practices and operating models, and seek ways to improve efficiency and consistency**
  - **Streamlining the formal aspects of the process**
    - Each lab is asked to present a 20-minute synopsis of their business model for stewardship use of facilities
  - **Protection of IP and legal matters**
    - Each lab is asked to present a 15-minute synopsis of process and practice for IP protection and forming legal relationships with stewardship users
- **Discuss outreach strategy**
  - Each lab is asked to give a short verbal summary of outreach activities

Operational Meeting this Fall to Discuss Test Facility Pilot Program

Initial Topical Area Workshops

- **Workshops organized to assess needs in two identified target areas**
  - Ion Beam Therapy Workshop (co-sponsored by NIH/NCI)
    - January 9-11, 2013 in Bethesda, MD
      - organized by DOE
  - Laser Technology for Accelerators Workshop
    - January 23-25, 2013 in Napa, CA
      - organized by LBNL
  - Both meetings were small and tightly focused
    - attendance by invitation only; included stakeholder agencies
      - limited number of industrial "observers" accommodated
- **Motivated by power efficiency and sustainability considerations across the SC complex, a 3rd topic area is under consideration:**
  - Efficient power systems for accelerators

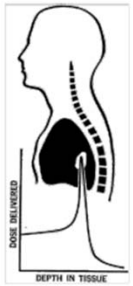
DOE/NIH Ion Beam Therapy Workshop Charge

January 9-11, 2013, Bethesda, MD

- **Prepared jointly by DOE-HEP and NIH-NCI**
  - **Identify a set of representative clinical applications** that span the range of expected future therapy requirements. These need to include capabilities for performing radiobiological experiments as well as human treatment protocols in order to explore the scientific principles underlying observed clinical results and point the way to promising protocol designs.
  - **Assess the corresponding beam requirements** (e.g., energy range and energy spread, intensity range and pulse-to-pulse intensity jitter, spot size and pulse-to-pulse position jitter, repetition rate, ion species) for future treatment facilities and compare these with today's state-of-the-art.
  - **Assess the corresponding beam delivery system requirements** (e.g., energy and position adjustability, time scale for adjustments, size of footprint, component mass, transverse and longitudinal acceptance) for future treatment facilities and compare these with today's state-of-the-art.
  - **Identify R&D activities needed to bridge the gap between current capabilities and future requirements**; include an assessment of which R&D investments are likely to have the highest near-term performance gains.

DOE/NIH Ion Beam Therapy Workshop Report

January 9-11, 2013, Bethesda, MD



The Report highlighted 8 themes:

- **Further studies of radiobiology and clinical efficacy are needed**
- **Machine R&D leading to**
  - **cost and size reduction**
  - **faster beam control and diagnostics**
  - **Faster 3D scanning**
  - **Smaller, less costly gantries**
  - **Real-time range and dose verification**
- **Future facilities will need multiple ion species**
- **International operational & clinical experience should be leveraged**

http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Workshop_on_Ion_Beam_Therapy_Report_Final_R1.pdf

DOE Workshop on Laser Technology for Accelerators

January 23-25, 2013 Napa, CA.

- Charge:
  - Identify laser-based accelerator applications
  - Assess laser specifications for each
  - Identify technical gaps
  - Specify R&D activities needed to bridge gaps
  - Assess the proposed U.S. R&D activities against global laser R&D efforts
- Attended by ~50 participants; ~10 industry, ~5 international, including members of DOE-HEP, DOE-BES, DOD, NSF, CRS.
- Ultrafast lasers (<1 ps) operating at high average power (>1 kW), and highest power efficiency (>20%) as flexible, tunable, laboratory-based systems
- Challenges
  - No PW/kW gain materials; too low damage threshold optics
  - Costly, inefficient pumps
  - Little experience coherently combining ultrafast lasers
  - Pulse contrast and optical phase noise

http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Lasers_for_Accelerators_Report_Final.pdf

Using the engineering demonstrators for world-class science

The 1 kW and 10 kW demonstrators can drive multi-color high peak brilliance photon sources that serve as the foundation of new, modest-scale user facilities.

NSF Engineering Research Center for Extreme Ultraviolet (EUV) Science and Technology

Essential to the success of the EUV ERC strategic plan is the development of compact and cost effective sources of coherent EUV light with significantly improved capabilities. Two complimentary approaches are being pursued: High Order Harmonic Generation and EUV Lasers.

Operation Parameters of EVU Source

High Harmonics Generation (HHG)	EUV lasers
• Very High Repetition Rate 1-100 kHz	• Low Repetition Rate 0.1-100 Hz
• Femtosecond pulse width	• Picosecond-nanosecond pulse width
• Low Pulse Energy nJ	• High Pulse Energy 50nJ-1mJ
• Moderate Monochromaticity $\lambda/\Delta\lambda \sim 10$	• High Monochromaticity $\lambda/\Delta\lambda \sim 10$
• High Spatial Coherence	• High Spatial Coherence
• Highly Tunable	• Tunability limited to line selection

During the first year of the EUV ERC significant progress was made in decreasing the size of the coherent EUV light source testbeds, and in extending their operation to shorter wavelengths.

Created 2003 as partnership of CSU, UCo Boulder, UCB, LBNL

The 1 kW Demo laser would enable kilohertz-class tunable HHG & xtal sources of:

- ~mJ-class EUV pulses
- ~μJ-class soft x-ray pulses

Compared with the EUV ERC:

- *10^6x higher peak brilliance*
- *10x higher average brilliance*

Laser R&D Ecosystem

Domestic R&D

$300M DoD – CW/Long pulse, high power (kW-MW), deployable, efficient, compact, lightweight

$25M DOE-NNSA – Long pulse, high energy (MJ), high power, efficient

$5M DOE-SC – Broad (enabling tech.)

$2M NSF – Broad (enabling tech.)

$2M Others

Foreign R&D

$35M Fraunhofer ILT – near-term, mat'l proc.

$23M LZ Hannover – Ultrafast, mat'ls

$20M ENSTA – applications of UF lasers, LOA

Asia—Semiconductor Foundries ⇔ Communications lasers

Laser R&D for Accelerators

Ultrafast (<1 ps)

Efficient (>20%)

High Average Power (>1 kW)

Flexible, tunable

Laboratory systems

Very high MTTF

Research Locales

76% Defense Contractors

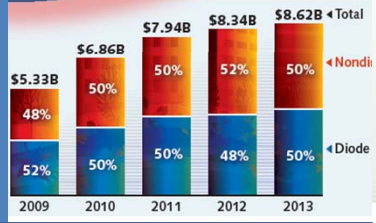
Laser Industry

14% DoD Labs

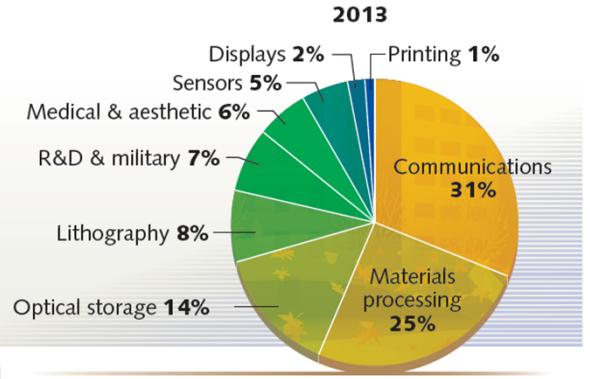
DOE-NNSA Labs

DOE-SC Labs

10% Academia



Worldwide Market



"Laser Markets Rise Above Global Headwinds", *Laser Focus World*, Jan 2013.

National Initiatives

National Photonics Initiative

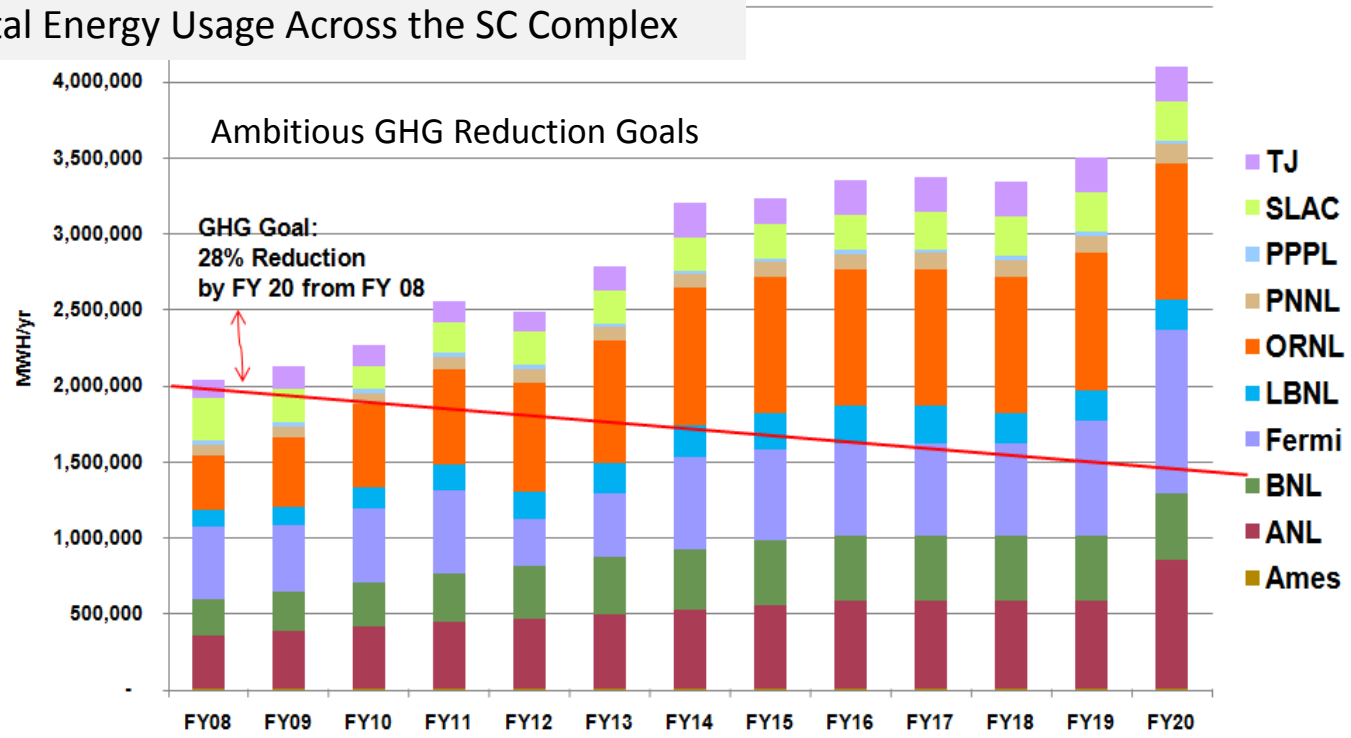
NNMI: Additive Manufacturing Inst.+14 (1B$)

NRC Study on Ultrafast Lasers

Increasing the Energy Efficiency of Accelerators

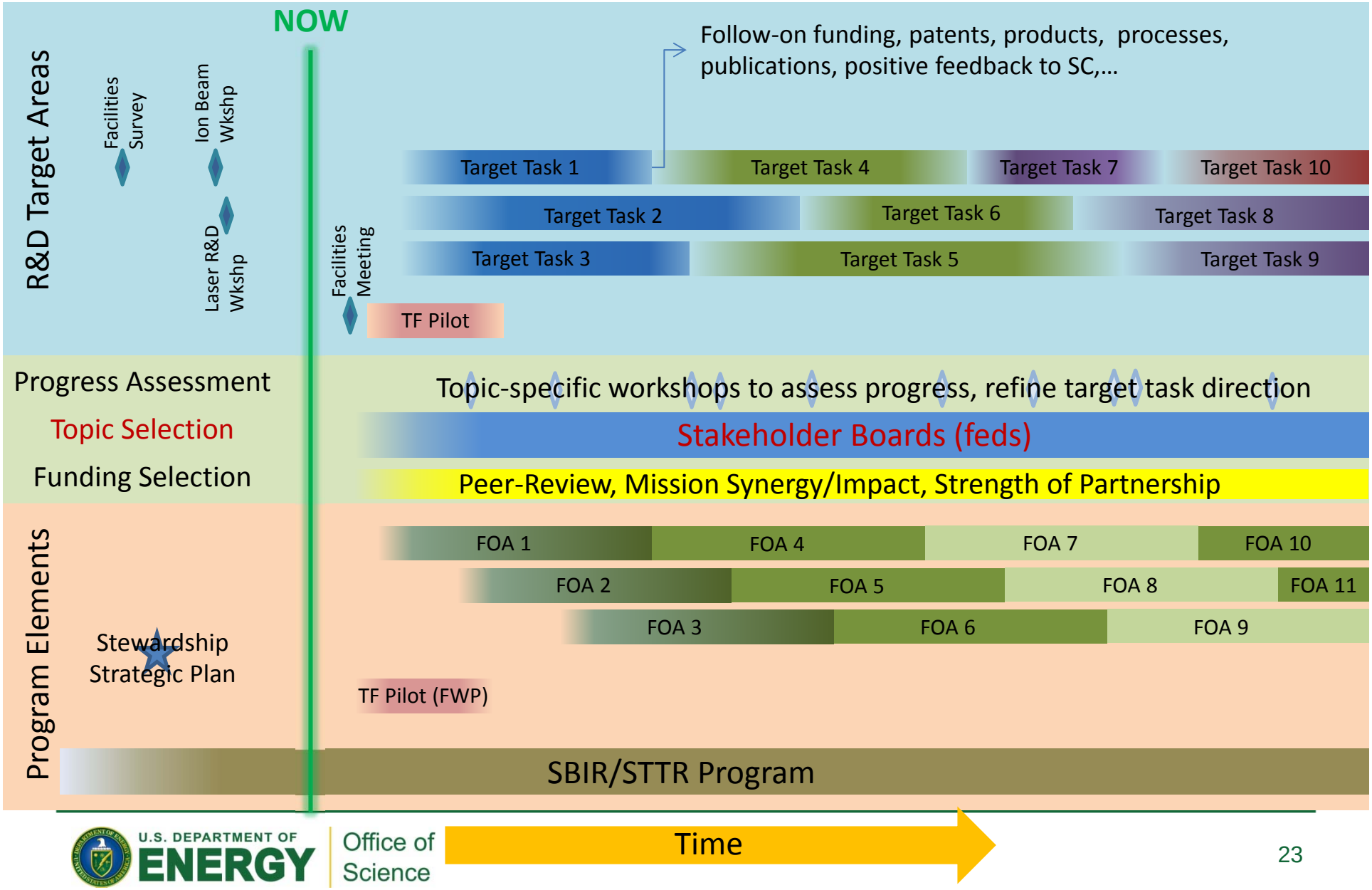
EO13514 mandates 28% GHG reduction from FY08 to FY20

Total Energy Usage Across the SC Complex



- Current DOE SC complex accelerator energy usage is ~1000 GW-h/yr
  - Projected to increase 50% by 2018
- Initiative to reduce accelerator efficiency will have broad impact across SC labs

Vision for the Accelerator R&D Stewardship Program



FY2014 Energy and Water Development Appropriations Bill S. 1245, (June 27, 2013)

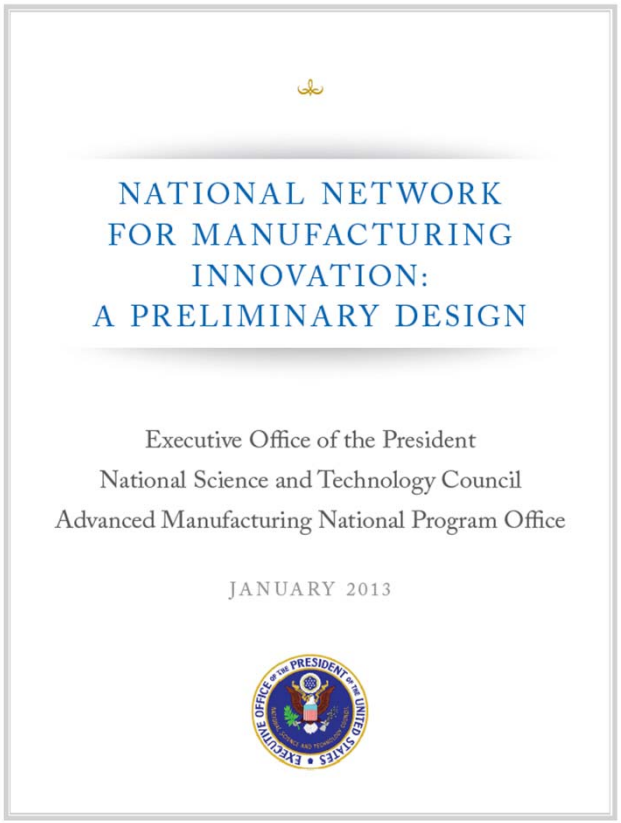
mates, and encourage international collaborators to make financial contributions. Within the funds for High Energy Physics, the Committee recommends $15,000,000 to support minimal, sustaining operations at the Homestake Mine in South Dakota.

Within the funds for High Energy Physics, the Committee also recommends $20,000,000 for Accelerator Stewardship. The Committee recognizes the critical role accelerator technology can play in addressing many of the economic and societal issues confronting the country. The Committee supports the Office of Science's efforts to make unique test facilities available to U.S. industry to accelerate applications of accelerator technology. Testing accelerator technology, such as at beam facilities, is the only, unambiguous way to demonstrate the operational efficacy of a new technology and represents the final step in validating a design concept.

NUCLEAR PHYSICS

The Committee recommends $569,938,000 as requested for Nuclear Physics. Within these funds the Committee recommends

Accelerator Stewardship Seen in a Broader Context



http://manufacturing.gov/nnmi.html

- **President Obama announced in 2011 a 1B$ initiative to promote American manufacturing capabilities.**
  - This became the **National Network for Manufacturing Innovation** (NNMI), to be composed of up to 15 **Institutes for Manufacturing Innovation** (IMIs).
  - Managed through the Advanced Manufacturing National Program Office (AMNPO), hosted by DOC-NIST.
  - IMIs are expected to receive 70-120M$ in federal funds over 5-7 years, to be matched 1:1 by the proposing non-profit consortium.
  - IMIs must be self-sustaining within 7 years
- **1+3 IMIs have been started or proposed:**
  - NAMII (funded, operating)
  - Wide Bandgap Materials (DOE-AMO)
  - LM3I and DMDI (DoD)

Accelerator Stewardship Seen in a Broader Context

- For a majority of Accelerator R&D Stewardship activities, the intent is to carry the R&D forward to first prototype testing under relevant conditions. (ie to TRL 5-6)
- NNMI intends to fund both the technology development and the manufacturing development up to TRL 7/MRL 7.

Accelerator R&D Stewardship

National Network for Manufacturing Innovation

Work For Others

NATIONAL NETWORK FOR MANUFACTURING INNOVATION: A PRELIMINARY DESIGN

Table 1. Technology Readiness Levels and Manufacturing Readiness Levels, after [21]

TRL 1:	Basic principles observed and reported	MRL 1:	Manufacturing feasibility assessed
TRL 2:	Technology concept and/or application formulated	MRL 2:	Manufacturing concepts defined
TRL 3:	Analytical and experimental critical function and/or characteristic proof of concept	MRL 3:	Manufacturing concepts developed
TRL 4:	Component and/or breadboard validation in a laboratory environment	MRL 4:	Capability to produce the technology in a laboratory environment
TRL 5:	Component or breadboard validation in a relevant environment	MRL 5:	Capability to produce prototype components in a production relevant environment
TRL 6:	System/subsystem model or prototype demonstration in a relevant environment	MRL 6:	Capability to produce prototype system or subsystem in a production relevant environment
TRL 7:	System prototype demonstration in an operational environment	MRL 7:	Capability to produce systems, subsystems or components in a production relevant environment
TRL 8:	Actual system completed and qualified through test and demonstrated	MRL 8:	Pilot line capability demonstrated; Ready to begin Low Rate Initial Production
TRL 9:	Actual system proven through successful mission operations	MRL 9:	Low rate production demonstrated; Capability in place to begin Full Rate Production

NNMI Target

3.3 IMI Funding, Revenue, and Sustainability

Each Institute should be of sufficient size and scope to have major national and regional economic impacts and to address the multidimensional challenges associated with the Institute's focus area. The amount of Federal funding should be appropriate to the Institute proposed. Federal funding to launch

National Network for Manufacturing Innovation: A Preliminary Design

Five Criteria for "Good" Accelerator R&D Stewardship Activities

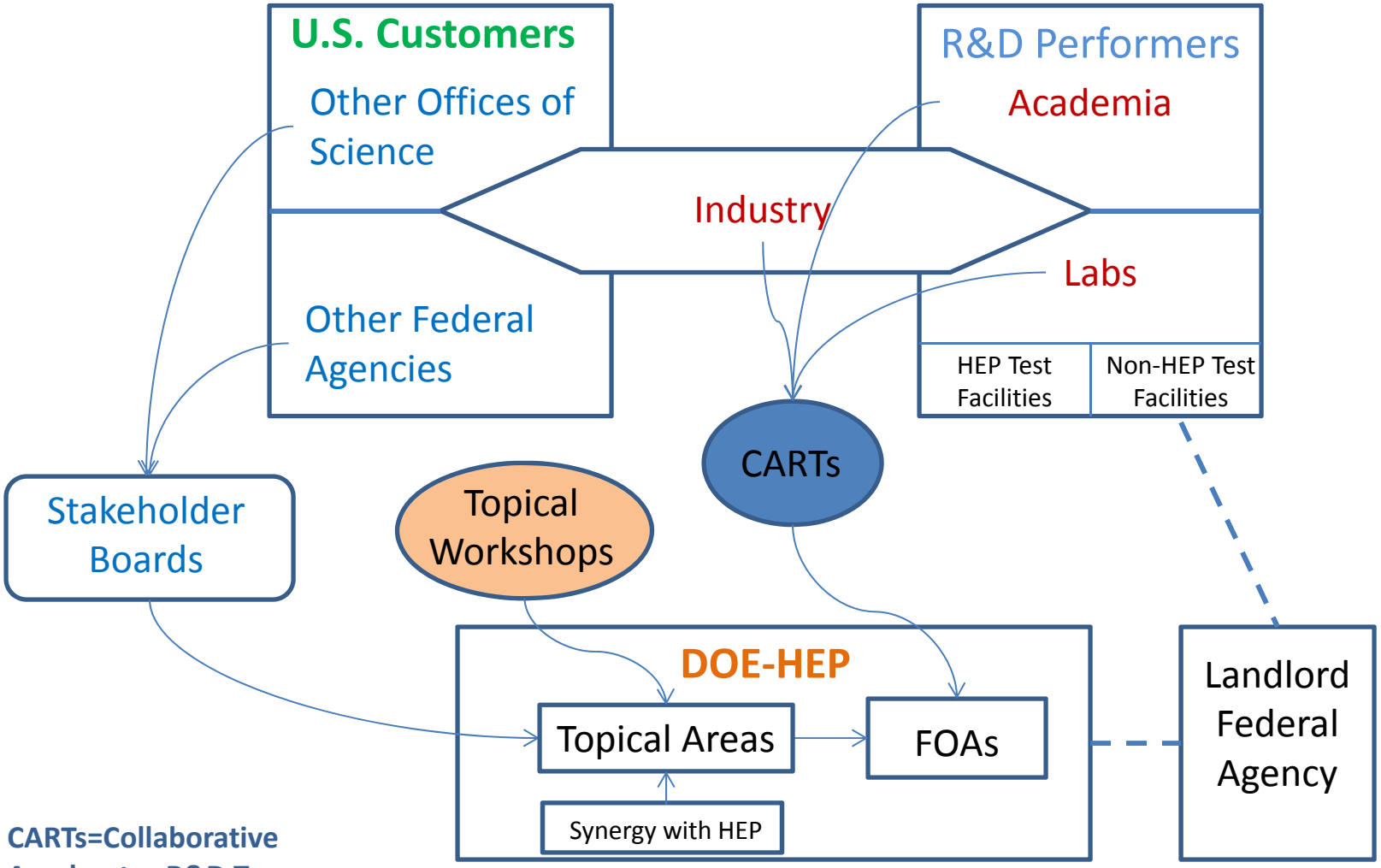
1. **The application must involve accelerators or accelerator-related technologies either as:**
   1. Accelerator Research that has synergy with and benefits the primary HEP mission
   2. Accelerator Development (but often this will be WFO)
2. **There must be non-trivial intellectual involvement of the lab.**
   Good: Build an accelerator technology component (NB: usually WFO)
   Better: Design an accelerator technology component (WFO?)
   Best: Design, build, and test an accelerator technology component (Stewardship)
3. **The activity must be reasonably consistent with the mission of the lab, and minimally impact the primary SC program.**
   Good: Activity **maintains** a
   Better: Activity **expands** a
   Best: Activity **develops a new**
   (again, this is usually WFO)
   core skill or facility needed for the mission
4. **The lab must arguably be the best provider* of the capability or service.**
   Good: Lab's capability is not unique, but lab is close to customer
   Better: Lab's capability is leading, and lab is close to customer
   Best: Lab is the only possible provider
5. **The customer benefiting from the stewardship activity must endorse the goals.**
   Good: Customer participates in discussion of task definition, writes letter of support
   Better: Customer and lab partner on research, some cost sharing from customer (e.g. 1:10)
   Best: Customer and lab partner on research, significant cost sharing from customer (e.g. 1:1)

*and must not compete with an existing business

Stewardship, SBIR/STTR, and WFO

	Accelerator Stewardship	SBIR/STTR & TTO	WFO
Mission	• Open Lab Facilities • Apply accelerators to solve challenging problems	• Move technology towards market • Stimulate small businesses	• Customer-defined, as consistent with lab's mission
Technical & Manufacturing Readiness	TRL 1-6 MRL none	Phase I: TRL 2-3 Phase II: TRL 3-4/MRL 1-4	TRL ~2 to 9 MRL 1 to ~8
Time Horizon	Up to ~10 years	9 mos/24 mos	Customer-defined
Topic Selection	Stakeholder Boards	Lab input, DOE selects	Lab Selects
Progress Review	Community Workshops Grant Reports Contact with users (UECs)	Grant Reports	Customer-defined metrics
Funding Mechanism	Peer-reviewed FOAs	Peer-reviewed FOAs	WFOA/CRADA
Intellectual Involvement of Lab	Significant	(no requirement)	(no requirement)

Accelerator R&D Stewardship Is Always a ≥3 Body Interaction



CARTs=Collaborative Accelerator R&D Teams

What does Success Look Like?

- **Opening Access to Test Facilities**
  - Co-investment from the customer (OFA or industry)
  - Publications, patents, new products/processes, positive feedback
  - Facilities improve; new intellectual connections formed
- **Ion Beam Therapy**
  - New components tested, industry partnerships formed, devices commercialized
  - TFs enable radiobiology experiments to be realized
  - Patient outcomes improved, treatment costs reduced
  - Beam capability and technology improved generally
- **Laser Technology R&D**
  - High power ultrafast laser technologies advanced
  - 1 kW test facility built, OFAs invest in science center based on the test facility
  - 10 kW test facility built, OFAs invest in 2nd science center based on the TF
  - GeV-demonstrator built for potential HEP application
- **Energy-Efficient Accelerator Power Systems**
  - High voltage modulator and high power rf technologies become more efficient
  - Industry adopts and produces new designs, HEP and OFAs buy new components
  - Significant impact on GHG emissions in SC accelerator applications

May 2013: In recent news…

May 8, 2013

ScienceInsider
Breaking news and analysis from the world of science policy

NRC Head Says Realignment Means 'Full Meal' for Canadian Industry

by Wayne Kondro on 8 May 2013, 1:35 PM | 4 Comments

Share Email Share Print | Share Share 0 Share Share More More

The Canadian government's makeover of the 97-year-old National Research Council will significantly alter the nature of its research and how it operates, says NRC President John McDougall.

Plans to make it a "toolbox for industry" will require the NRC's structure, staffing, and research programs to evolve as industrial partnerships develop, McDougall says in an interview today. Some institutes or research groups may have to be transferred to other government departments or to academe, he says, while others will be jettisoned if they prove "obsolete in a total sense" or "they are operating too far up upstream."

The new NRC will be very "fluid," he says, pulling expertise from its various divisions and groups to focus on an industrially-driven initiative. "The intent is to allow people to access the full-meal deal," MacDougall says. "We used to operate in a very siloed way, in fact, virtually as independent organizations and because of that, we weren't able to give people what they really need. People don't need a little bit of science or a component of technology. What they need is a whole solution, and if you can't provide the whole solution, then it's very difficult to get things to go anywhere."

ENLARGE IMAGE

Open for business. NR
John McDougall at an ev

Credit: National Researc
Canada

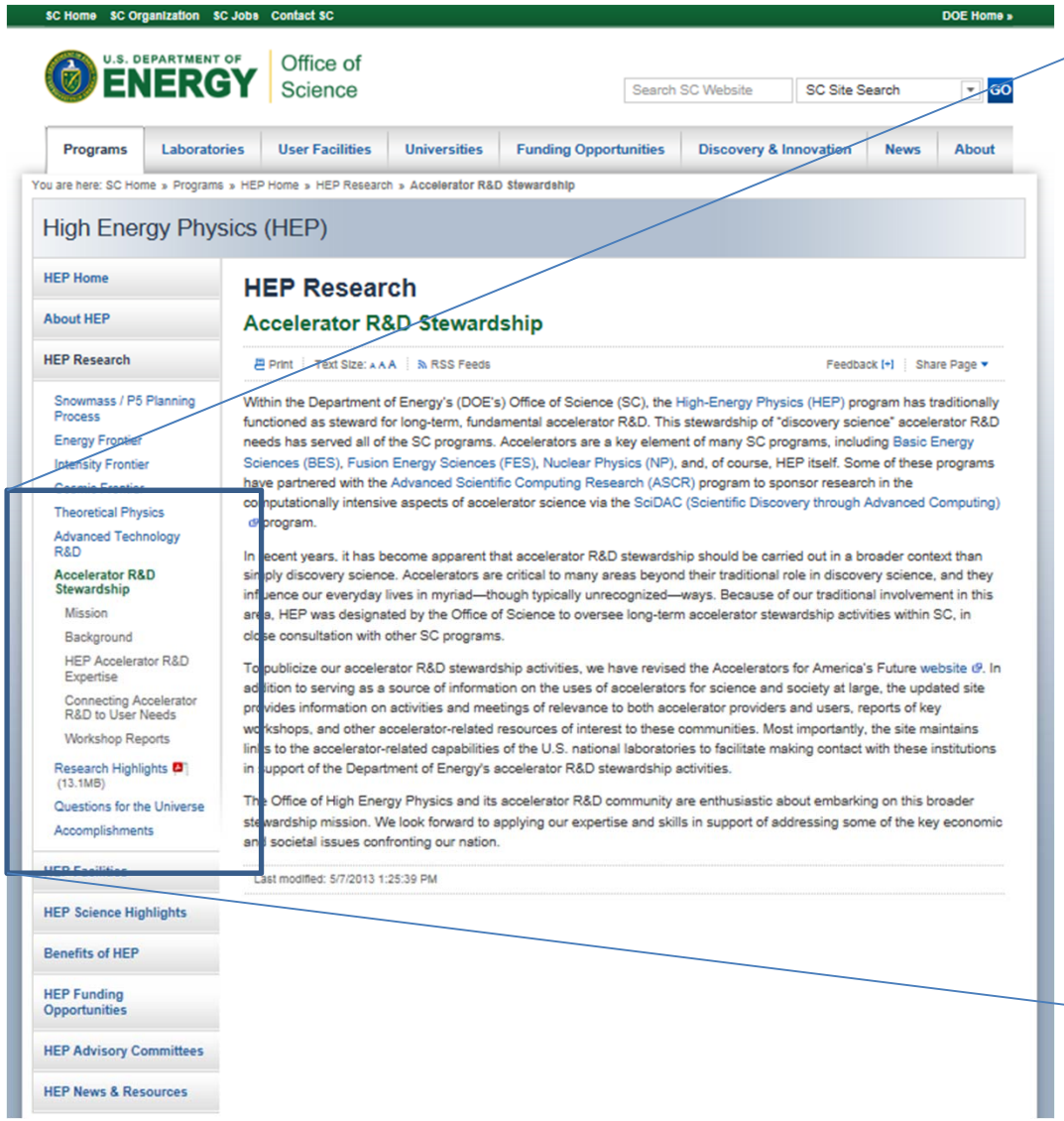
- "Some institutes or research groups may have to be transferred to other governments departments or to academe, [NRC President McDougall] says, while others will be jettisoned if they prove "obsolete in a total sense" or "they are operating too far upstream."
- "People don't need a little bit of science or a component of a technology. What they need is a whole solution…"

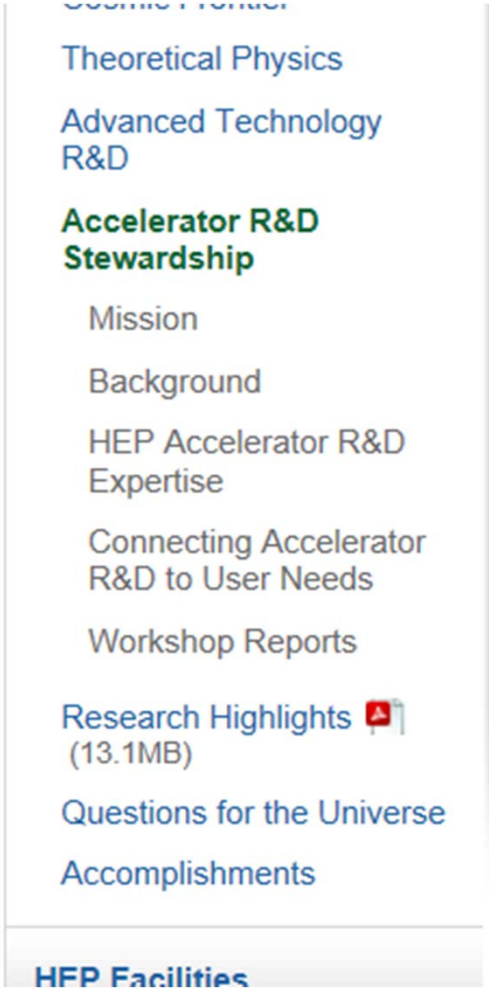
http://news.sciencemag.org/scienceinsider/, accessed 6/20/2013.

How can you engage?

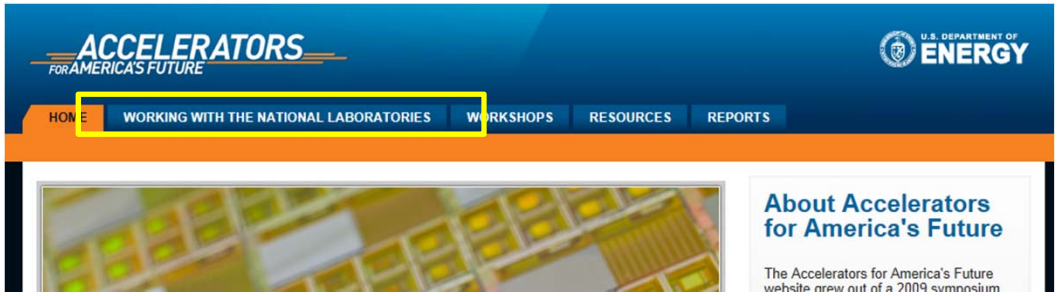
- **Read the Stewardship program description and workshop reports at**
  - http://science.energy.gov/hep/research/accelerator-rd-stewardship/
- **Opening Test Facilities Pilot Program call**
  - Identify potential lab test facility customers and understand their needs
  - Wait for fall meeting charge to come
- **Topical Area calls**
  - Start gathering ideas, think about your collaborative teams
  - Be aware of related calls
    - The NIH P20 call for a National Center for Particle Beam Radiation Therapy Research http://grants.nih.gov/grants/guide/pa-files/PAR-13-096.html
    - DOE SBIR/STTR new topic area for laser technology
- **Propose new, challenging topical areas**
  - Must result in a "solution" that is broadly useful within a <10 year timeframe
  - There must be market-pull for the "solution"—know your "customer"!

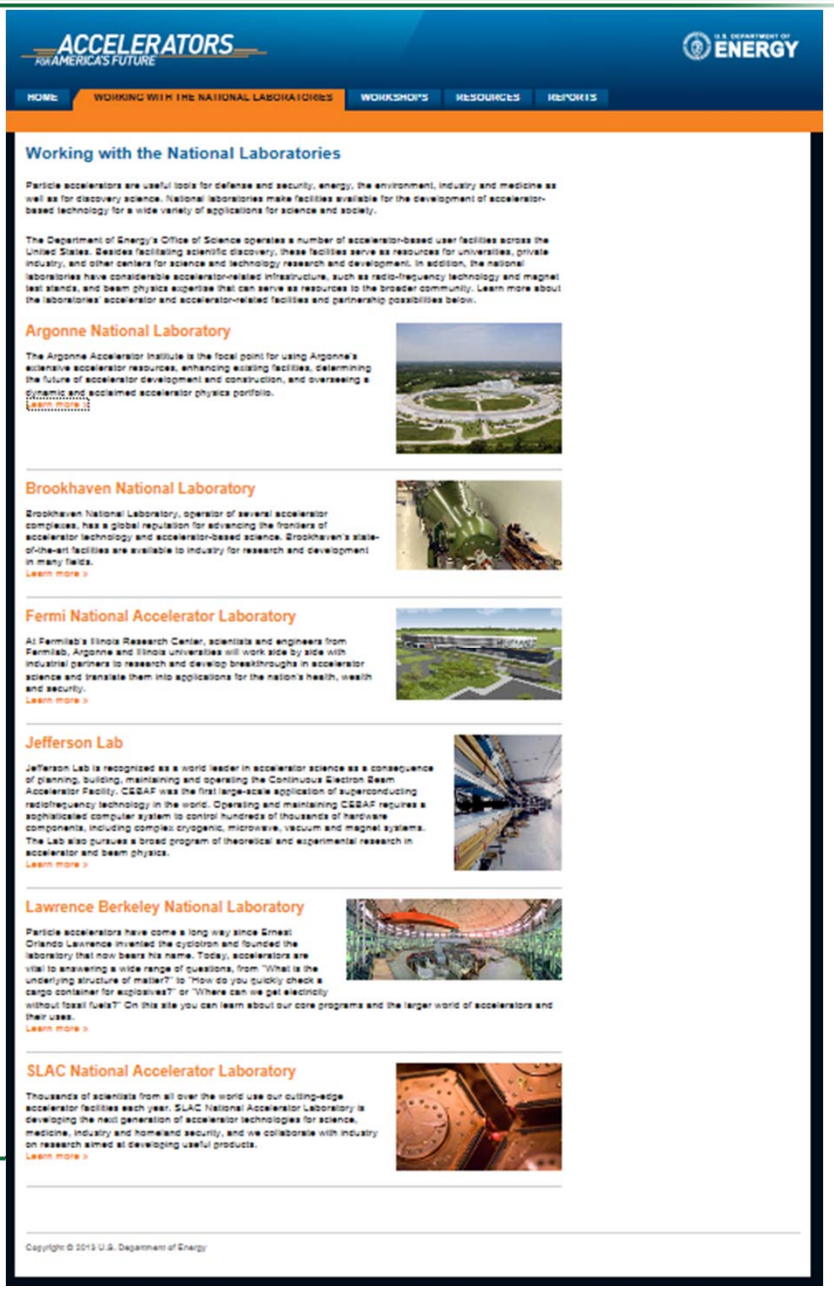
HEP Accelerator R&D Stewardship Web Site





Accelerators for America's Future Web Site





The nation's portal for new users to browse lab capabilities and identify a contact person for more information.

Accelerator Stewardship Seen in a Broader Context

It is outreach

- **Accelerator R&D Stewardship is strengthening HEP's integration with other science funding agencies**
  - Within the Office of Science: BES, NP, FES, ASCR, BER, …
  - Within DOE: EERE, NNSA, …
  - Within the Executive Branch: NIH, DOD, DOC, …
- **Creating new connections, collaborations, and directions of research**
- **Creates broader awareness of the value of High Energy Physics in general, and HEP technologies in particular**

It is a nearer-term societal contribution from our research

- **Critical in an age of increasing pragmatism**
- **Done on terms we define**