

Background

Initially spinoff of Brookings Great Lakes study
 Big 10 + Pac 10 + Big 12 (+ Batelle)
 Added Don Lamb, David Pines, Nate Lewis
 Ran by industry, labs (Wadsworth, Sandia, ORNL...), OMB, Congress
 Added AAU, NASULGC
 Became plank in Brookings Blueprint for American Prosperity
 February 9 launch at National Press Club (over 500)
 Meetings with OSTP, Chu, Johnson, ...

Key Points of Brookings Institution Next Energy Project

1. Building a sustainable energy infrastructure will require new technologies, which have yet to be developed, and hence new scientific knowledge.
2. Yet the nation has been woefully underinvesting in the necessary energy R&D
 - Federal level of \$3.4 B/y is only 20% of 1980...and less than 10% of investment in other national priorities such as biomedical, space exploration, and defense.
 - Energy industry has lowest R&D level of any economic section (0.1% of revenues), over 20 times below that of electronics, pharmaceuticals, etc.
3. Hence first step is a dramatic increase in federal energy R&D to \$25 to \$30 B/y (comparable to biomedical research).
 - Most will flow to national labs and industry, but there should be a more concerted effort to tap the capabilities of American research universities as equal partners to the labs and industry in energy research. (The ARPA-E and EFRC programs do this to some extent.)
 - Some have suggested a Manhattan Project or Apollo Program effort. But this is quite different from putting a man on the moon. Rather it really involves building an entirely new economic sector focused on renewable energy technologies.
 - Augment existing research activities (national labs, industry R&D, university research) with new paradigms for translational research, from fundamental scientific research to technological innovation to pre-commercialization to deployment

- These would span the complex array of issues—scientific, technological, economic, social, behavioral, policy while producing the human resources, scientists, engineers, managers—necessary to build and maintain a sustainable energy infrastructure.
4. Hence new approach...e-DIIs...but rather an old approach...land-grant movement that build modern economic sectors of American agriculture and industry in the 20th century. We propose using this to develop, commercialize, and deploy the innovative new technologies necessary to build a sustainable energy infrastructure in the U.S.

e-DIIs

Existing paradigms

Agricultural and engineering experiment stations
 Cooperative extension service
 Academic medical centers

NAE Study on Engineering Research: Discovery-innovation centers

Proposal: The federal government should establish a national network of regionally based energy discovery innovation institutes (e-DIIs) to serve as the hubs of a distributed research network linking the nation's best scientists, engineers and facilities.

Establish a network of several dozen e-DIIs, ranging in size from EFRC-like for single institutions (\$5 M -\$10 M/y) to national lab-like for large consortia (\$200 M/y), linked by "spokes" to smaller energy research projects and centers.

Key themes:

Translational (linking scientific research to technological innovation to pre-commercial development to deployment to markets)
 Partnerships: feds, states, universities, industry, entrepreneurs, nat labs
 Interdisciplinary: beyond simply science and technology
 Regional focus: economic development, green jobs
 Education: producing human capital and public understanding

Three flavors:

Research universities
 National labs
 Partnerships among universities and labs
 (but likely off the campus and outside the fence to free them from existing academic and laboratory cultures)

Process: Start off slow by launching a few in 2010
 Most in DOE but perhaps some in NSF, DOT, NIST

Current Situation

DOE Budget Request

Eight “Energy Innovation Hubs”, funded at \$280 M, to support
 Cross disciplinary research and developed focused on the
 barriers to transforming energy technologies into
 commercially deployable materials, devices, and systems
 Chu: Think of Joint Bioenergy Institute or “Bell Lablettes”

Waxman Markey Energy Bill

Eight “Clean Energy Innovation Centers” at \$280 M
 Each must involve two research universities plus partner
 Regionally based consortiums
 Targeted technology focus
 Cost-sharing at 10% level

So where do we stand:

We believe that the strategy proposed by the administration is very much aligned with our recommendations, both in the scale of commitment to energy R&D (\$15 B/y) and the proposed “energy innovation hubs”.

In fact, we believe the combination of ARPA-E for transformational research, EFRCs for engagement of top scientists and engineers, and energy innovation hubs for translational research is a very powerful approach to conducting the R&D necessary to develop a sustainable energy infrastructure.

Primary differences:

- DOE is starting with large consortium based e-DIIs (\$50 M) rather than with a mix of small and large. However some of the EFRCs could evolve into e-DIIs if successful discoveries lead to possible commercial products.
- DOE’s initial e-DIIs are strongly technology focused on narrow technical areas and would need to evolve to achieve the far broader intellectual span (encompassing beyond science and technology the range of economic, social, behavioral, and policy issues we envisioned)
- DOE’s e-DIIs apparently do not have the strong regional character we suggested, which we believe would be both a powerful stimulus for local economic development and green job creation, as well as creating the powerful grassroots political support characterizing the land-grant paradigm.

But it is off to a great start, and we intend to do everything we can to support the proposed effort!