

September 18, 2014

The Honorable Dianne Feinstein  
Chairwoman  
Senate Appropriations Subcommittee on  
Energy and Water Development  
184 Dirksen Senate Office Building  
Washington, D.C. 20510

The Honorable Lamar Alexander  
Ranking Member  
Senate Appropriations Subcommittee on  
Energy and Water Development  
188 Dirksen Senate Office Building  
Washington, D.C. 20510

Dear Senators Feinstein and Alexander:

We are fusion scientists and engineers from institutions and facilities throughout the United States writing to express our concern about the language included in the Senate's FY 2015 Energy and Water Appropriations bill and report that would not only cut the budget for the domestic fusion program and underfund U.S. contributions to ITER in FY 2015, but also order U.S. withdrawal from that project.

Both the domestic research and facilities program and ITER are important elements for the development of fusion energy in the United States. The domestic program – which funds many of the labs, universities, and programs for which we work – is crucial to developing the scientific basis for fusion energy, establishing the foundation for the next steps in the U.S. fusion program, and providing the scientific context and workforce from which to reap the benefits of U.S. investments in ITER. The ITER project itself is the largest international science collaboration in the world, with the scientific objective of understanding the burning plasma state in which the power from fusion reactions dominates the behavior of the plasma, and a mission of demonstrating the scientific and technological feasibility of fusion energy. U.S. involvement in ITER also has direct near-term economic benefits: as of March 2014, more than \$616 million in ITER contracts have been awarded to U.S. manufacturers, universities, and DOE national laboratories in 40 states plus the District of Columbia, many of whom have been, or will be, able to leverage this gained expertise to win additional contracts from other ITER partners.

ITER is a challenging project. Indeed, harnessing fusion into a commercial energy source is one of the greater scientific and technical endeavors ever undertaken. ITER construction is made all the more challenging by the complexities inherent in implementing an international partnership of seven sovereign entities, each of whom is responsible for providing the timely delivery of its own contributions without having full control over the cost, schedule, and management of the overall project.

The deficiencies within the ITER Organization must be addressed in an effective and timely manner and we are pleased that the ITER Council has approved implementation of the management recommendations put forth by the Final Report of the 2013 ITER Management Assessment. We also welcome Congressional insistence that DOE ensure that these urgent

management reforms are implemented and support Congressional demands for a reliable project performance baseline.

We share the Committee's frustration with the serious management problems of the international ITER project and the cost increases both international and domestic. We are also disappointed with the Administration's pattern of funding U.S. contributions to the project through decreases to the domestic fusion program and the Administration's proposal in FY 2015 to substantially reduce both programs from their FY 2014 appropriated levels. However, we believe that withdrawing from ITER would be a serious mistake for the United States and our energy future. When successful, ITER will be viewed as a landmark science and energy experiment of the 21st century. Participation in ITER and access for our scientists to the ITER research will yield great benefits toward U.S. progress in fusion. U.S. withdrawal from ITER would deprive our nation and the next generation of our scientists from crucial scientific participation and experience that will be available to others. It would also almost certainly undermine our nation's reputation as a reliable partner in international science projects.

The ITER Organization is expected to complete an updated schedule by June 2015 that covers the full ITER construction phase. At that time, the effectiveness of the management reforms implemented by the Council should be assessed and further corrective measures taken if necessary. In the meantime, we respectfully encourage the Committee to fully fund the domestic research and facilities program and the ITER project at no less than the FY 2014 level, and allow the U.S. to continue to fulfill the full scope of its research, design, and fabrication obligations to ITER.

*The following endorse this letter as individual scientists and engineers not formally representing their home institutions:*

Mohamed Abdou  
University of California, Los Angeles

Charles Baker  
Albuquerque, New Mexico

Tyler Abrams  
Princeton University

Dennis Baker  
North Augusta, South Carolina

Abdulgadar Almagri  
University of Wisconsin-Madison

Roger Bangerter  
Beavercreek, Oregon

David Anderson  
University of Wisconsin-Madison

Harold S. Barnard  
Massachusetts Institute of Technology

Jay K. Anderson  
University of Wisconsin-Madison

John Barnard  
Pleasanton, California

Seung Gyou Baek  
Massachusetts Institute of Technology

Jayson Barr  
University of Wisconsin-Madison

Larry Baylor  
Farragut, Tennessee

Matt Beidler  
West Virginia University

Paul Bellan  
California Institute of Technology

Abraham Bers  
Massachusetts Institute of Technology

Nicola Bertelli  
Princeton University

Amitava Bhattacharjee  
Princeton University

J. Boedo  
University of California, San Diego

Rejean Boivin  
San Diego, California

Michael Bongard  
University of Wisconsin-Madison

Paul Bonoli  
Massachusetts Institute of Technology

Mohamed Bourham  
North Carolina State University

Robert Bourque  
Los Alamos, New Mexico

Dylan Brennan  
Princeton University

Joshua Breslau  
Princeton University

Matthew Brookhart  
University of Wisconsin-Madison

David Brower  
University of California, Los Angeles

Michael Brown  
Swarthmore College

Dan Brunner  
Cambridge, Massachusetts

Dean Buchenauer  
Pleasanton, California

Tom Burgess  
Oak Ridge, Tennessee

Richard J. Buttery  
San Diego, California

Patrick Byrne  
Columbia University

James D. Callen  
University of Wisconsin-Madison

Paul Campbell  
University of Michigan

Troy Carter  
University of California, Los Angeles

John Cary  
Tech-X Corporation

Peter J. Catto  
Massachusetts Institute of Technology

John Caughman  
Oak Ridge, Tennessee

Antoine Cerfon  
New York University

Choong-Seock Chang  
Princeton University

Brett Chapman  
University of Wisconsin-Madison

Xi Chen  
San Diego, California

Adam Cohen  
Princeton University

Bruce Cohen  
Orinda, California

Darren Craig  
Wheaton College

Alexander J. Creely  
Massachusetts Institute of Technology

Neal A. Crocker, II  
University of California, Los Angeles

Benjamin J. Cross  
Aiken, South Carolina

Ronald C. Davidson  
Princeton University

N. Anne Davies  
Boys, Maryland

Evan Davis  
San Diego, California

Stephen O. Dean  
Montgomery Village, Maryland

Diego del-Castillo-Negrete  
Oak Ridge, Tennessee

Anthony R. DeMeo  
Plainsboro, New Jersey

Thomas J. Dolan  
University of Illinois

Daniel Den Hartog  
University of Wisconsin-Madison

John DeLooper  
Princeton University

Russell Doerner  
University of California, San Diego

Arturo Dominguez  
Princeton University

David Donovan  
University of Tennessee-Knoxville

Ami M. DuBois  
University of Wisconsin-Madison

Eric Edlund  
Massachusetts Institute of Technology

Florian Effenberg  
University of Wisconsin -Madison

Dennis L. Eggleston  
Occidental College

Laila A. El-Guebaly  
University of Wisconsin-Madison

Paul Ennever  
Massachusetts Institute of Technology

David Ennis  
Auburn University

Phil Ferguson  
Knoxville, Tennessee

Peter Fimognari  
Madison, Wisconsin

Raymond Fonck  
University of Wisconsin-Madison

Cary Forest  
University of Wisconsin-Madison

Jeffrey Freidberg  
Massachusetts Institute of Technology

Johan Frenje  
Massachusetts Institute of Technology

Matthew Galante  
University of Wisconsin-Madison

David Gates  
Princeton University

Wilhelm Gauster  
Avon, Connecticut

Nasr Ghoniem  
University of California, Los Angeles

Alexander Glasser  
Columbia University

Robert J. Goldston  
Princeton University

Theodore Golfopoulos  
Massachusetts Institute of Technology

James B. Graham  
Princeton University

Robert Granetz  
Massachusetts Institute of Technology

Charles Greenfield  
Poway, California

Martin Greenwald  
Massachusetts Institute of Technology

Houyang Guo  
San Diego, California

Walter Guttenfelder  
Princeton, New Jersey

Eliezer Hameiri  
New York University

David Hammer  
Cornell University

Christopher Hansen  
University of Washington

James D. Hanson  
Auburn University

Gregory Hartwell  
Auburn University

R.W. (Bob) Harvey  
CompX, Del Mar, California

Adil Hassam  
University of Maryland, College Park

Richard Hawryluk  
Princeton University

R.D. Hazeltine  
University of Texas at Austin

Frank Heckendorn  
FD Technologies LLC

Chris Hegna  
University of Wisconsin-Madison

William Heidbrink  
University of California, Irvine

Philip Heitzenroeder  
Princeton University

Nathaniel Hicks  
University of Alaska Anchorage

Edward Thomas Hinson  
University of Wisconsin-Madison

Don Holly  
University of Wisconsin-Madison

E. Bickford Hooper  
Danville, California

Aaron Hossack  
University of Washington

Amanda Hubbard  
Massachusetts Institute of Technology

David Q. Hwang  
University of California, Davis

R. Lawrence Ives  
Calabazas Creek Research, Inc.

Craig Jacobson  
University of Wisconsin-Madison

Thomas Jarboe  
University of Washington

Hantao Ji  
Princeton University

David K. Johnson  
Massachusetts Institute of Technology

Maria Gatu Johnson  
Massachusetts Institute of Technology

Atma D. Kanojia  
Massachusetts Institute of Technology

Amy Keesee  
West Virginia University

Arnold Kellman  
San Diego, California

Andrei Khodak  
Princeton University

Jacob King  
Lafayette, Colorado

Stephen Knowlton  
East Montpelier, Vermont

Jonathan Koliner  
University of Wisconsin-Madison

Arnold Kritz  
Lehigh University

G.L. Kulcinski  
University of Wisconsin-Madison

Samuel Lazerson  
Princeton, New Jersey

Jeffrey Levesque  
Columbia University

Steven Limbach  
University of Wisconsin-Madison

Zhihong Lin  
University of California, Irvine

N.C. Luhmann, Jr.  
University of California, Davis

Arnold Lumsdaine  
Knoxville, Tennessee

Richard Majeski  
Princeton University

Ravi Marawar  
National Instruments

Michael Mauel  
Columbia University

David Mauer  
Auburn University

Meghan McGarry  
Madison, Wisconsin

George McKee  
University of Wisconsin-Madison

Dale Meade  
Princeton, New Jersey

Eric Meier  
Princeton, New Jersey

Jonathan Menard  
Princeton University

David Mikkelsen  
Princeton University

Joseph Minervini  
Massachusetts Institute of Technology

Vladimir Mirnov  
University of Wisconsin-Madison

Art Molvik  
Livermore, California

James Morin  
University of Wisconsin-Madison

Lewis Morris  
Princeton University

Lucas A. Morton  
University of Wisconsin-Madison

Richard Moyer  
San Diego, California

Bob Mumbaard  
Massachusetts Institute of Technology

Tobin Munsat  
University of Colorado

Gerald A. Navratil  
Columbia University

Hutch Neilson  
Princeton University

Brian A. Nelson  
University of Washington

Charles Neumeyer  
Princeton University

Mark Nornberg  
University of Wisconsin-Madison

Ryan Norval  
University of Wisconsin-Madison

Masayuki Ono  
Princeton University

Dmitri Orlov  
San Diego, California

Ronald Parker  
Massachusetts Institute of Technology

Tony Peebles  
University of California, Los Angeles

Francesca Poli  
Princeton University

Miklos Porkolab  
Massachusetts Institute of Technology

Stewart Prager  
Princeton University

Lester Price  
Knoxville, Tennessee

M.J. Pueschel  
University of Wisconsin-Madison

Tariq Rafiq  
Lehigh University

Abhay K. Ram  
Massachusetts Institute of Technology

Roger Raman  
University of Washington

Juergen Rapp  
Jupiter, Florida

Murali Ravindran  
National Instruments

Michael E. Read  
Calabazas Creek Research, Inc.

Noah Reddell  
University of Washington

Susana Reyes  
San Francisco, California

Barrett Rogers  
Dartmouth College

William Rowan  
University of Texas at Austin

David N. Ruzic  
University of Illinois

John Sarff  
University of Wisconsin-Madison

Mohamed Sawan  
University of Wisconsin-Madison

Samuel Schaub  
Massachusetts Institute of Technology

Lothar Schmitz  
University of California, Los Angeles

Oliver Schmitz  
University of Wisconsin-Madison

Kenneth R. Schultz  
Leucadia, California

Eugenio Schuster  
Lehigh University

Earl Scime  
West Virginia University

Steven D. Scott  
Princeton University

Shahram Sharafat  
University of California, Los Angeles

John Sheffield  
ISSE, University of Tennessee—Knoxville

Uri Shumlak  
University of Washington

Thomas Simonen  
Berkeley, California

Hong Sio  
Massachusetts Institute of Technology

Charles Skinner  
Princeton University

David R. Smith  
University of Wisconsin-Madison

Sergey Smolentsev  
University of California, Los Angeles

Philip Snyder  
San Diego, California



Carl Sovinec  
University of Wisconsin-Madison

Don Spong  
Oak Ridge, Tennessee

Weston Stacey  
Georgia Institute of Technology

Daren Stotler  
Princeton University

Derek A. Sutherland  
University of Washington

Ryan Sweeney  
Columbia University

Craig M.V. Taylor  
Los Alamos, New Mexico

Gary Taylor  
Princeton University

Tony S. Taylor  
Poway, California

Richard Temkin  
Massachusetts Institute of Technology

James L. Terry  
Massachusetts Institute of Technology

Tim Tharp  
University of California, Berkeley

Edward Thomas, Jr.  
Auburn University

Kathleen Thome  
University of Wisconsin-Madison

George Tynan  
University of California, San Diego

Nermin Uckan  
Oak Ridge, Tennessee

Mark Uhran  
Oak Ridge, Tennessee

Brian Victor  
University of Washington

Francesco Volpe  
Columbia University

Jens von der Linden  
University of Washington

François Waelbroeck  
University of Texas

Jeff Waksman  
White Plains, New York

Gregory Wallace  
Massachusetts Institute of Technology

Ronald E. Waltz  
San Diego, California

Andrew Ware  
University of Montana

Harold Weitzner  
New York University

Frank J. Wessel  
University of California, Irvine

Anne White  
Massachusetts Institute of Technology

Michael D. Williams  
Princeton University

Simon Woodruff  
Woodruff Scientific, Inc.

John C. Wright  
Massachusetts Institute of Technology

Jonathan Wrobel  
JW Research & Design, LLC

Alice Ying  
University of California, Los Angeles

Setthivoine You  
University of Washington

Dennis Youchison  
Albuquerque, New Mexico

William Young  
University of Wisconsin-Madison

Howard Y. Yuh  
Nova Photonics Inc.

Michael Zarnstorff  
Princeton University

Andrew Zwicker  
Princeton University