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**Position Statement on the U.S. Department of Energy Fiscal Year 2017 Budget Request
submitted by the ASME Energy Public Policy Task Force**

March 15, 2016

The American Society of Mechanical Engineers (ASME) Energy Public Policy Task Force (Task Force) of ASME's Committee on Government Relations is pleased to provide this testimony on the Fiscal Year 2017 (FY17) budget request for Research and Development (R&D) programs in the Department of Energy (DOE).

ASME has long advocated a balanced portfolio of energy supplies to meet the nation's growing energy needs, including advancing clean coal, petroleum, nuclear, natural gas, waste-to-energy, biomass, solar, wind, hydroelectric power, and other technologies. ASME also supports energy efficient building and transportation technologies, as well as transmission and distribution infrastructure sufficient to satisfy demand under reasonably foreseeable contingencies. A balanced energy portfolio will allow the U.S. to maintain its quality of life while addressing our environmental and security challenges. Sustained growth in the energy systems on which the U.S. depends will also require stability in licensing and permitting processes not only for power generating stations but also for energy supply systems, and transmission and transportation systems.

Office of Energy Efficiency and Renewable Energy (EERE)

EERE manages America's investments in Research, Development and Deployment of DOE's diverse energy efficiency and renewable energy applied science portfolio. The FY17 budget request of \$2.897 billion, an \$825.4 million, or 40 percent, increase over the FY16 appropriated amount of \$2.07 billion, demonstrates the Administration's strong commitment to clean energy technology development. Most of the key EERE programs, including Bioenergy, Solar, Wind, Geothermal, Building Technologies, Vehicle Technologies, and Advanced Manufacturing technologies, receive substantial increases in funding to support the growth of renewable energy and energy efficiency.

While the Task Force appreciates that Congress may not be able to meet the Administration's full request for FY17, we are pleased to see increases for both the Advanced Manufacturing program (\$261 million, or a 14 percent increase), as well as the Building Technologies Program (\$289 million, or a 44 percent increase). The budget for Vehicle Technologies R&D is similarly slated to receive a \$158 million increase to \$468.5 million for FY17. We believe that the development of transportation fuel systems that are not petroleum-based is a critical part of our future national energy policy. ASME believes that these high-impact areas of investment offer significant payoffs for the economy as a whole, both in energy savings and potential for innovation job creation.

EERE's Advanced Manufacturing Office (AMO) aims to improve the energy efficiency and productivity of the U.S. manufacturing sector by bringing together industry and research institutions to tackle cross-cutting sectoral challenges. The AMO provides valuable RD&D

funding support and technical assistance through competitive, merit reviewed funding opportunities designed to investigate processes, information, and materials technologies around high-impact energy-related manufacturing technologies.

The Task Force strongly supports DOE's investments in this area, particularly in the areas materials, process engineering, additive manufacturing, and smart grid. We encourage Congress to provide full funding for DOE's request for the nation's Clean Energy Manufacturing Innovation Institutes, including funding for one new institute. ASME similarly supports AMO's funding request for DOE's Energy Innovation Hubs, including the new Energy-Water Desalination Hub, and AMO's contribution towards DOE's Clean Energy Manufacturing Initiative and Energy-Water Nexus crosscuts.

Office of Electricity Delivery and Energy Reliability (OE)

The FY17 budget request of \$262 million for OE is a 27.3 percent, increase over the FY16 appropriated amount of \$206 million. The Task Force is pleased by the level of interagency coordination related to transmission siting, cyber security activities being led by OE with the Federal Energy Management Agency (FEMA) and the Department of Defense (DOD).

The integration of all cost effective electric generating and storage technologies into the operation of the electricity distribution system is critical to economic operation of the national electric grid. The Task Force believes that R&D related to the integration of the electric grid and its control as a truly national system is imperative for the growth of effective and economic energy generation technologies and we encourage full funding for such research. We urge Congress to strive for full funding for each of these strategic investment areas and to strongly encourage continued inter-office and inter-departmental coordination, as OE's programmatic area of responsibility has a natural connection to the mission of every other DOE Office.

The Task Force believes advances in power electronics, micro-grids, systems integration, controls, and modeling and simulation are going to be critical in a future more modern electric grid. We are pleased to see that the OE budget seeks robust support Energy Storage and the Infrastructure Security and Energy Restoration program areas.

Office of Nuclear Energy (NE)

Total funding for the DOE NE for FY17 would rise to \$993.9 million, a 0.7 percent increase over the FY16 enacted amount of \$986 million. The Task Force remains convinced that nuclear energy holds an important role in the nation's energy future. While funding for Small Modular Reactors (SMR) Licensing and Technical Support has received a strong request, programs like Reactor Concepts (slated for a \$32.9 million budget cut) and Fuel Cycle R&D need sustained funding to aid the nation's transition to a low-carbon energy future. Reactor Concepts is a particularly critical program as the commercial nuclear reactor fleet faces life extension challenges. Lack of funding for this type of research in nuclear energy may adversely impact the ability of the current US reactor fleet to continue to operate past its 60 year life. The loss of funding may also contribute to the loss of the US nuclear technology competitive edge in developing the nuclear technologies of the future.

Office of Fossil Energy (FE)

The FY17 FE R&D budget request proposes structural changes through combining coal and natural gas capture technologies into one category and reducing the number of line items in the program. The U.S. has access to significant unconventional gas and liquid petroleum resources

with the potential to provide an abundant, affordable, and environmentally sound energy source for years to come. Prior FE R&D programs have contributed to making this possible through multidisciplinary and cross-agency funded research.

The potential for environmentally responsible unconventional oil and gas energy development, particularly unconventional offshore resources, will not be realized unless our nation makes the investments to ensure that these resources can be produced reliably, economically, safely, and with minimal environmental impact. Accomplishing this task and keeping the U.S. in the forefront of unconventional fossil energy technology will require basic research, technology development, and advances in low impact environmental technologies that will not be undertaken by industry in the current economic and regulatory climate. We urge Congress to support the Unconventional Fossil Energy Technologies, Gas Hydrates, and Natural Gas programs at their FY 2016 level.

The Task Force recommends funding the Carbon Capture and Storage (CCS) and Advanced Power Systems program area (formerly the CCS and Power Systems area) at the FY16 level. Coal is, and will remain, a critical resource for our nation and the global energy economy. We must continue to invest in research that will reduce coal's environmental impacts and to retain our global leadership in coal-based technology. New systems such as pressurized oxy-combustion and chemical looping combustion should be deployed in the 2025 time frame to retain coal in our national power generation mix. Funding for coal programs should be directed toward large and commercial scale demonstration projects to shorten the development period for deploying new technologies. We further recommend increasing coordination between the Advanced Research Projects Agency-Energy (ARPA-E) and FE programs to ensure the development of newer technologies that can further decarbonize fossil fuels to take advantage of our nation's abundant resources.

The Administration has recommended that \$240 million in previously appropriated funds for demonstration projects be reprogrammed to support the core R&D programs. The Task Force strongly recommends that the Fossil Energy R&D programs be funded through new appropriations of at least \$650 million and that no funding be deobligated from the demonstration projects program. The Task Force recommends that funding be provided under the new Crosscutting Research and Analysis program to increase allocations for the University Coal Research and HBCU programs and for breakthrough technology research programs at the lower technology readiness levels to develop next generation technologies for fossil energy systems.

Advanced Research Projects Agency-Energy (ARPA-E)

The Task Force supports the \$500 million budget request for the ARPA-E. ARPA-E received its first funding as part of ARRA, but has stood out quickly among its fellow DOE programs. ARPA-E has already spun out over 30 new energy companies and represents a significant opportunity for the U.S. to cultivate technological breakthroughs related to energy sources, and uses. ARPA-E is also a highly-leveraged federal investment, as the agency has received over \$1.0 billion in matching private sector investment for start-up spin-offs. A steady commitment to ARPA-E has begun to encourage new energy technology innovation and the Task Force believes that this is a worthwhile endeavor for the DOE as we seek to accomplish technological breakthroughs in energy technology research.

Office of Science

The mission of the Office of Science (SC) is the delivery of scientific discoveries and major

scientific user facilities and tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States. The FY17 budget proposal of \$5.672 billion is an increase of \$325 million, or 6.0 percent, from the FY16 appropriation.

ASME urges Congress to provide the SC with *at least* the Administration's requested amount in FY17. This will enable the Office to optimize the operation of its unique scientific facilities which are used by tens of thousands of industry, university, and government scientists and engineers and expand university research through dedicated, competitive grants. We also ask Congress to restore proposed \$40 million cut to the domestic research budget within the Fusion Energy Science program without compromising the integrity and vitality of all of DOE's Science programs.

As successive budget cycles come and go, the nation is getting further away from the funding trajectories necessary to sustain long-term energy innovation. Science programs in high energy physics, fusion energy sciences, biological and environmental research, basic energy sciences, and advanced scientific computing, serve, in some small way, every student and research institution in the country. These funds support not only research at the DOE Laboratories, but also the work at a large number of researchers from other federal agencies, universities and colleges, and companies that use our national lab system's instruments for cutting edge research across a wide array of disciplines.

Other DOE Programs

DOE is also very active in areas outside of R&D. The environmental remediation program that funds the decommissioning and decontamination of old DOD & DOE facilities is one such research area. The Task Force urges close oversight of funding for the Environmental Management program, requested at 6.1 billion for FY17, a 1.6 percent reduction.

Conclusion

Members of the Task Force consider the issues related to energy to be some of the most important facing our nation. There is an urgent need for more coherent and consistent national energy policies. The Task Force recommends adoption of a broad-based, bipartisan National Energy Vision to provide an outline for the future that reflects our values as a nation, identifies the greatest challenges and opportunities in energy that must be addressed, and guides future policy decisions related to key energy challenges. Such a vision can help ensure that investments in research will be made that grow and strengthen our energy and innovation future domestically and our competitiveness and leadership globally. This National Energy Vision should be periodically reviewed and modified as the country's challenges and opportunities change.

We applaud the Administration and Congress for their understanding of the important role that scientific and engineering breakthroughs will play in meeting our energy challenges. To promote such innovation, strong support for energy research will be necessary across a broad range of technology options. DOE research can play a critical role in allowing the U.S. to use our current resources more effectively and to create more advanced energy technologies.

Thank you for the opportunity to offer testimony regarding both the R&D and other parts of the proposed budget for the DOE. The Task Force is pleased to respond to requests for additional information or perspectives on other aspects of our nation's energy programs.

This statement represents the views of the Energy Public Policy Task Force of ASME's Committee on Government Relations and is not necessarily a position of ASME as a whole.