



### **SETTING THE STANDARD...**

- **IN ENGINEERING EXCELLENCE**
- **IN KNOWLEDGE, COMMUNITY AND ADVOCACY**
- **FOR THE BENEFIT OF HUMANITY**

ASME's mission is to serve diverse global communities by advancing, disseminating and applying engineering knowledge for improving the quality of life; and communicating the excitement of engineering.

ASME helps the global engineering community develop solutions to real world challenges. Founded in 1880 as the American Society of Mechanical Engineers, ASME is a not-for-profit professional organization that enables collaboration, knowledge sharing and skill development across all engineering disciplines, while promoting the vital role of the engineer in society. ASME codes and standards, publications, conferences, continuing education and professional development programs provide a foundation for advancing technical knowledge and a safer world.



[www.go.asme.org/foundation](http://www.go.asme.org/foundation)



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Design, content and production: Infinia Group, LLC.



# 2013 GLOBAL IMPACT REPORT

THIS YEAR'S REPORT IS  
FOCUSED ON **FOUR KEY AREAS**  
WHERE WE DO THE MOST TO  
ADDRESS, ADVOCATE AND  
ACTIVATE CHANGE WORLDWIDE:

 **SAFETY**

 **SUSTAINABIL**

 **HEALTH**

 **WORKFORCE**

# ITY

## **INTELLIGENCE, APPLIED FOR GOOD.**

Our efforts in these critical areas demonstrate progress toward ASME's mission: *to serve diverse global communities by advancing, disseminating and applying engineering knowledge for improving the quality of life; and to positively communicate the excitement of engineering.*


**Developing real world solutions to real world challenges is the shared objective of all engineers.** Since our founding in 1880, we've strived to share knowledge and skill across disciplines and industries, while promoting awareness of the vital role of the engineer in society.

**For ASME, this has become a global mission.** Our influence and network continue to grow: we have more than 130,000 members, and a growing percentage of ASME committee volunteers representing over 50 countries. Through our work, we have established a presence in more than 150 countries — over a hundred of which recognize and accept our standards.

Global Impact requires a collective effort. **It depends on the right people having access to the right resources at the right time.** Consequently, we have expanded our digital engagement to provide a platform to share, explore, and discuss the latest discoveries, developments, theories and prototypes with the global community of engineers.

Through standards, publications, conferences, continuing education and professional development programs, online forums and communities, ASME helps focus engineering intelligence where it can do the most good.

It's an approach that brings shape and substance to our Global Impact.



**ASME IN 2013:  
130,000  
MEMBERS IN  
150+  
COUNTRIES,  
8 MILLION+  
VISITORS TO  
ASME.ORG.**



## LEADING CHANGE.

Change doesn't just happen; it is planned, designed and driven. Very few professions get to be at the heart of fundamental change. As engineers, we've always been at the crossroads of change and we play **a critical role in applying science and technology to transform the world.**

From the wheel to clean water supply, from the printing press to computing, from telecommunications to transportation systems, from mechanics to medicine, engineers have been central to progress, contributing to the fabric of our existence — building paths to a prosperous and sustainable future.

ASME occupies a central position at the hub of many industries and sectors. The reputation and respect we have earned enable us to function as a catalyst, collaborating, sharing and spreading knowledge, new ideas, and intelligence that fuels change all over the world.

**We choose to focus on areas where we can have the most influence, to convene the forces that make change happen.**

These four interrelated areas define and drive our mission: Safety, Sustainability, Health and Workforce.

As engineers, we have the opportunity to help improve the lives of billions of people through innovations in energy, health, nutrition, housing, sanitation, and education. **As engineers, we are practical leaders of change.** For ASME, that's the essence of Global Impact: our challenge, our goal, our passion and what we celebrate in these pages.

The impact of all we do now may not be felt for generations. To work toward Global Impact is to identify and act according to anticipated needs. But engineers have always worked this way, with one eye focused on the future and the greater good at heart. That's what good and progressive agents of change do.

Whether through new ideas, interactions, integrations or introductions, what all of us at ASME — our professional associates, partners and students — have achieved together this past year is inspiring. Imagine what we can realize in the next year and beyond.

A handwritten signature in black ink, appearing to read 'Tom Loughlin', with a long horizontal flourish extending to the right.

Thomas G. Loughlin  
Executive Director, ASME

# SAFETY FIRST DOESN'T LAST.



Engineering challenges in maintaining safe, man-made systems are constantly evolving. Which is why **ASME is perpetually at the forefront of developing, upgrading, integrating and applying standards for industries and communities worldwide.**

Our goal: to keep the technology that surrounds us and affects our daily lives operating flawlessly.

Our role is increasingly multi-disciplinary; we find ourselves at a hub of innovation, aggregating expertise and perspectives. **Without innovation, there is no future safety.**

This approach is our legacy: when we convened industrialists and technical innovators in New York City for the first time in 1880, the discussion centered on engineering standards and work practices to enhance safety, reliability and efficiency in machine design and mechanical production.

The technology may have changed, but our essential strategy hasn't: **to ensure an infrastructure of equipment, conditions and practices that provides security and stability.**

Since our first Steam Boiler Code issued in 1884, ASME has become one of the most respected standards developers in the world. Our standards are building blocks on which innovation and progress are founded. They are proven frameworks that help guide engineers as they innovate and expand on what's possible.

As a respected third party, we work closely with industry groups and governments from around the globe addressing the individual needs of different regions, countries and jurisdictions. We promote openness and cooperation to establish standards that work best in each environment.

We are similarly neutral when it comes to energy, being a key enabler of technical and safety advancements in both traditional and new sectors, and collaborating across all power generation industries.





# NEW CLARITY: A NEW NUCLEAR SAFETY CONSTRUCT

Half of the world's nuclear power plants incorporate all or parts of ASME nuclear codes and standards in their construction, operation, and maintenance. Thirty of the forty-four nuclear nations purchase their nuclear components according to ASME specs.

At a Washington DC workshop in December 2012, entitled *Forging a New Nuclear Safety Construct*, we convened 125 decision-makers and leaders representing 20 countries, to help develop recommendations in response to the crisis at Fukushima, Japan. Among the recommendations stemming from the workshop:

The global acceptance of a set of cohesive regulations and standards to improve how nuclear plants are built and run, providing additional safeguards against accidental radioactive releases.

The formation of an international steering committee to improve (current and proposed) reactor safety, evaluate independent safety initiatives and create a consistent communications strategy.

The December 2012 event heralded four more related workshops in 2013, organized by ASME Training and Development to address seismic evaluation and equipment qualification.



**6,000+**  
**VOLUNTEERS FROM  
OVER 55 COUNTRIES  
CONTRIBUTE TO  
ASME STANDARDS  
COMMITTEES.**





# HALF OF THE WORLD'S NUCLEAR POWER PLANTS INCORPORATE ALL OR PARTS OF ASME NUCLEAR CODES AND STANDARDS.

## VERIFICATION & VALIDATION SYMPOSIUM: FIRST EVENT TO FUSE DISCIPLINES

ASME has long recognized that accelerating innovation to market is vital to economic growth and well-being. By integrating disciplines and ensuring better models, we can avoid or correct flaws earlier in the development process, accelerating the process of creating solutions.

In Las Vegas in May 2012, we organized [the first large-scale conference dedicated entirely to verification, validation and uncertainty quantification of computer simulations](#). At the ASME Verification and Validation (V&V) Symposium, engineers and scientists were brought together to exchange ideas and methods for refining, debugging and optimizing mathematical models, computational solutions, and experimental data. Industries and disciplines represented included nuclear power, civil engineering, defense applications, fluid and thermal mechanics, medical device design, mechanical engineering, high energy density physics, materials science, solid mechanics, space science and astrophysics, automotive, and structural dynamics.

Recognizing the growing interest in these fields, and the importance of fostering ongoing exchanges of technical information, ASME conducted another, even more successful V&V Symposium in 2013.

WE MAINTAIN

**530+**

STANDARDS

THROUGH

THE WORK OF

**700+**

COMMITTEES.

## ASME INTERNATIONAL WORKING GROUPS

Our success in providing technical rigor in an open and inclusive environment provides us unparalleled credibility, **enabling us to bring more perspectives into the safety conversation** — including those of traditionally under-represented countries. Our standards help extend relationships and enhance the adoption of safety designs, practices and procedures across industries, continents, and cultures.

OVER  
**6,900**  
MANUFACTURERS  
FROM AROUND  
THE WORLD  
ARE CERTIFIED  
TO ASME  
STANDARDS.



## **INTEGRATING STANDARDS IN INDIA**

In India, our long relationship with the Oil Industry Safety Directorate prompted the Ministry of Oil and Gas to identify ASME standards (particularly its Boiler and Pressure Vessel Code, and various B31 piping standards) as a key resource for regulatory development in the expansion of India's energy infrastructure. Four International Working Groups were also created to formally engage Indian experts on the relevant ASME code committees.

## **SPREADING THE WORD IN LATIN AMERICA**

In Latin America, we have created Spanish translation committees that work as official ASME standards developing committees, further **servicing the needs of the engineering community throughout Latin America**. By establishing a common vocabulary, we are able to provide versions that help local stakeholders — including key industry groups and regulatory agencies — understand and apply our codes in a local context. To date, the Committees have translated five codes addressing the pipeline industry.

**For us, safety is international, inclusive — and ongoing. Leveraging our open, transparent process and position as a neutral convener, ASME develops tools and procedures that facilitate safe and economically sustainable businesses around the globe. ■**

## **CLOSE COOPERATION WITH CHINA**

In China, our International Working Group (IWG) on ASME Nuclear Standards remains highly active and engaged as the country develops its nuclear power infrastructure. Since its formation in 2010, the IWG has collaborated closely with China's State Nuclear Power Technology Corporation (SNPTC), industry leadership and key organizations to build and operate nuclear power plants in accordance with ASME's nuclear codes.

# THERE'S NO SINGLE REASON TO PURSUE SUSTAINABILITY.



Sustainability is every engineer's challenge and integral to our work. However, at ASME, **we recognize that sustainability has complex, multiple meanings — social, economic, cultural, environmental, local, technical.** As one of the world's leading engineering societies, we are uniquely positioned to address all these dimensions as we apply our expertise to advancing new sustainable products and systems.

This invariably involves many do-no-harm factors, which is why our activities here frequently overlap with those in Safety and Health. Similarly, as with every other key area of Global Impact, **we collaborate and co-create sustainable solutions with those who actually have to introduce, integrate, run and maintain the operation** — whether the industry be power generation, health, or agriculture.

For ASME to have the most impact on sustainability, it's critical that we share intelligence and institutional knowledge, and continue to foster innovation. **Leveraging the web as a community tool to collaborate and develop appropriate solutions** has helped ASME to become a thought leader, sourcing the capabilities and expertise required to drive the next generation of sustainable engineering initiatives.



# WATER/ENERGY: A CRITICAL NEXUS

For several years, we have been at the forefront of what is termed the water/energy nexus: **the intrinsic connection between water and energy use and demand that comprises one of the planet's most compelling sustainability challenges.** Water is essential to every stage of energy production from extraction to processing, distribution, and the cooling of generating plants and systems.

## HOW WASTEWATER CAN HELP THE FLOW OF ELECTRICITY

The threat of freshwater shortages, along with increasing electricity demand, has encouraged the reuse of municipal wastewater by electric utilities. This reclaimed, retreated water can safely meet the water needs of power producing processes (mostly cooling) while conserving freshwater for other uses.

To support advances in this field, ASME convened a workshop jointly sponsored with the Water Environment Federation (WEF) in Washington DC: *Municipal Wastewater Reuse by Electric Utilities: Best Practices and Future Directions.*

ASME and WEF gathered leading experts from municipal wastewater plants and electric utilities. By creating a forum for these two highly opinionated and influential sectors, we helped each to share intelligence to identify mutually agreeable, sustainable solutions.

### Highlights included:

Defining the characteristics of successful municipal wastewater reuse projects at electric utilities.

Developing strategies to overcome substantial technical, regulatory, communications and public perception barriers to launch new projects.

Creating roadmaps to reduce the power sector's freshwater consumption without sacrificing power generation.

### Other initiatives proposed:

With EPA participation, gather and disseminate best practices for reclaimed water use in electric utilities.

Prompt municipal wastewater utilities to identify, gather and deliver data of interest to electric utilities.

Develop technology guidelines on reclaimed water reuse at power plants.

Share collective experience on municipal wastewater reuse by electric utilities.

Establish best-use guidelines for water and wastewater surplus.





## ASME ENERGY FORUM: NEW PERSPECTIVES NOW

The ASME Energy Forum has become an extremely popular brand in its own right — a multi-media series exploring new energy sources and related technologies. It's a place where we can offer expert perspectives on R&D, operations, issues and challenges, as well as the economic implications for businesses. Among the issues discussed this year: Waste-to-Power, Concentrated Solar Power (CSP), Hydrokinetics, and R&D Trends in Emerging Energy Technologies.

## DESALINATION: THE SOLUTION TO INDUSTRIAL FRESHWATER USAGE?

In January 2013, we hosted an *Industrial Demineralization (Desalination): Best Practices and Future Direction Workshop* in Washington DC. Its purpose was to highlight the need for alternative sources to freshwater in industrial processes, and establish a roadmap for implementing successful demineralization (desalination) projects. The workshop sought to promote and codify:

Clear communications and best practices to navigate regulatory and technological barriers.

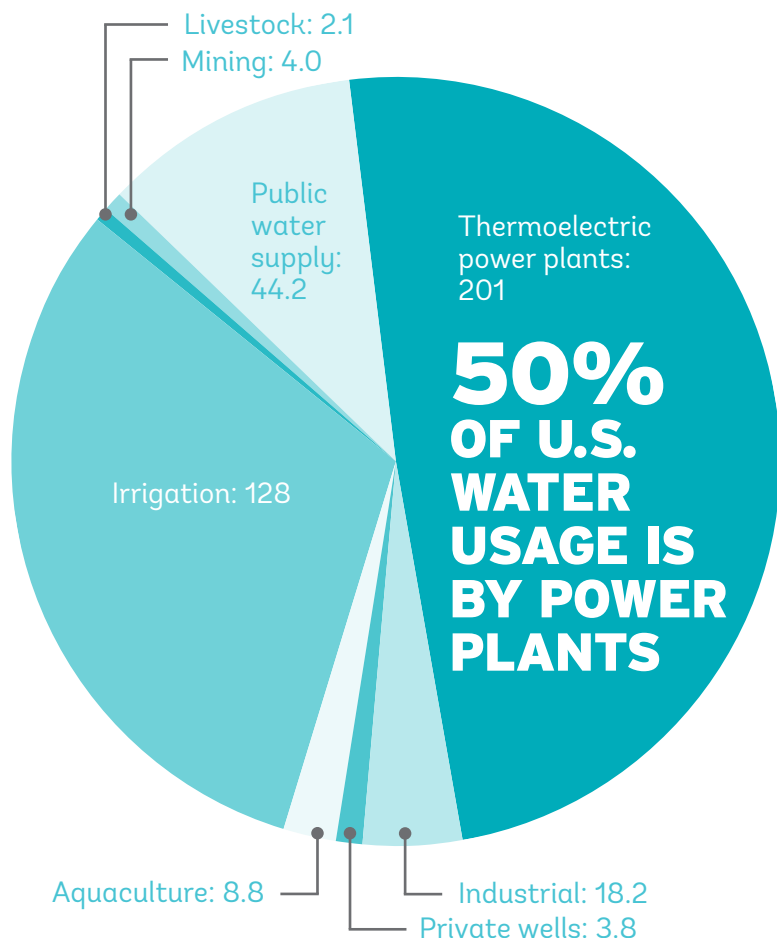
Identify the best course of “used” water, and define the quality of the product water needed.

Recognize and resolve differing priorities.

Create a best practices guideline document.

Identifying these challenges and recommendations allows industry players and public policy makers to better understand key challenges and gaps in the treatment and usage of “used” water, and ultimately help guide future decisions.

## TOTAL U.S. WATER WITHDRAWALS IN 2010, IN BILLION GALLONS PER DAY



Source: The 2030 Water Resources Group, Centre for Environmental Systems Research, University of Kassel



# ENGINEERING FOR CHANGE: A FORUM FOR THE FUTURE

An open, transparent forum co-founded by ASME for knowledge and content exchange, Engineering for Change (E4C) LLC harnesses many engineers' passion for creating technical solutions to a broad range of quality of life challenges. E4C supports local organizations by identifying appropriate solutions that have demonstrated impact.

The E4C Webinar Series further connects a community of over 17,000 engineers, technologists, social scientists, local BGOs and community advocates, all dedicated to improving quality of life worldwide. Over 15 webinars were held in 2013, attracting participants from an average of 12 countries. The subject matter engaged and inspired all attendees, with topics including:

A cooking smoke hood pilot program in Nepal that points the way to reducing indoor air pollution, which kills 2 million people each year.

Challenges and misconceptions of scaling energy access in developing countries.

A simplified negative pressure device, The Wound Pump, which may point the way toward a new, standardized design approach to medical devices for the developing world.

The use of low-cost cellphone communication and computer technology to improve the quality of healthcare in rural Nicaragua.

A project that aims to distribute, install, and maintain cleaner water and energy technologies to almost 3 million residents of Rwanda.

Facing underfunded distribution, a key challenge in the global supply chain.



**FROM ARGENTINA TO ZIMBABWE, EACH WEBINAR ATTRACTS PARTICIPANTS FROM 12 COUNTRIES, ON AVERAGE**





## DEM+ND: A PUBLICATION THAT PROMOTES AND PROVOKES

The UN General Assembly's commitment to reducing poverty by targeting Millenium Development Goals is mirrored in ASME's sustainability mindset: social innovation and novel solutions necessary to deliver real, lasting change to the disadvantaged can only come from multi-disciplinary perspectives.

A natural extension of this philosophy was the November 2013 launch of *DEM+ND*, ASME Global Development Review, created and published with *Mechanical Engineering* magazine, with additional reporting from Engineering for Change (E4C). A platform for engineers in global development to share insights with the greater engineering community, *DEM+ND* encourages collective learning by **examining the technical, programmatic and community challenges raised when it's not "engineering as usual"**. Mixing case studies, stories and original reports from expert contributing authors, *DEM+ND* (available in print and digital formats) profiles innovative solutions, while provoking engineers to rethink their approaches, methods and assumptions regarding global development.

ASME is elevating Sustainability around the globe by helping innovators to test, fund and get ideas to market more quickly. And by bringing together diverse expertise, we can continue the conversation at government and industry levels. Because we know that sustainability demands a sustained effort. ●

## ASME SURVEY

## A MODERN MINDSET: SURVEY SHOWS INCREASING SIGNIFICANCE OF SUSTAINABILITY TO ENGINEERS

A survey conducted jointly by ASME and 3D design software company Autodesk reveals a growing environmental consciousness in the occupational mindset of engineers. Drawn from the responses of 4,500 engineering practitioners and 1,900 engineering students, the 2012 ASME/Autodesk *Sustainable Design Survey* quantifies increased interest in incorporating energy-saving and other green initiatives into product design projects.

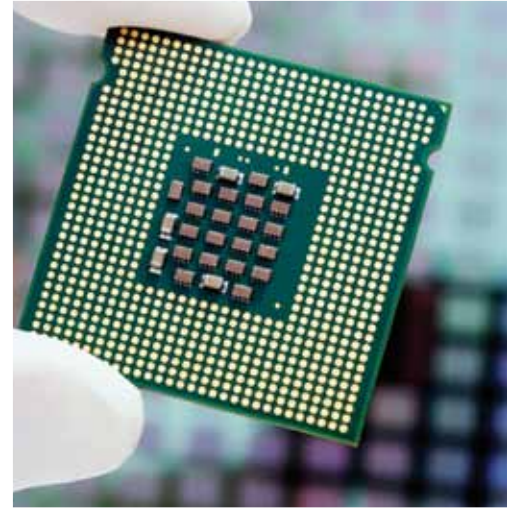
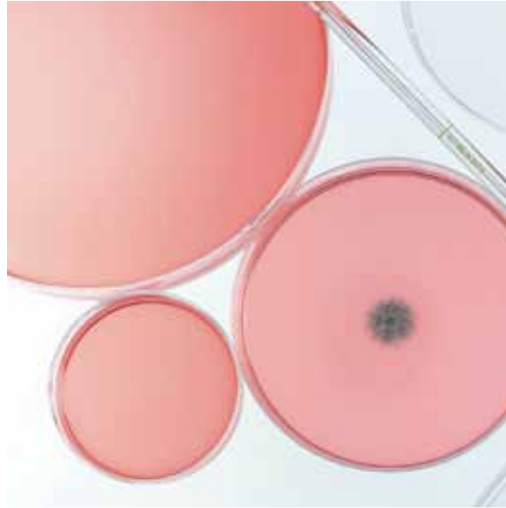
Some key findings:

**87%** of respondents indicated they are "extremely or somewhat" interested in sustainable information and causes.

**75%** of respondents believe that sustainable designs produce greater product innovation.

**70%** of respondents said their companies are involved on projects that reduce energy or emissions or that comply with environmental standards and regulations.

# WITHOUT US, HEALTH WON'T GET BETTER.



There have been few advances in health care and medicine in which engineers and engineering have not played a significant role.

**The engineer remains a key contributor at every stage of the health continuum** — from innovative research in health and medicine, to the design of new medical technology, to the provision of clean water, to laboratory sterility and the pharmaceutical/BPE standards.

Taking advantage of engineering's position at the intersection of technology growth, policy development and educational resources, **ASME helps facilitate and foster progress across the breadth of the health spectrum.**

ASME is active in many healthcare environments, **aggregating knowledge and expertise to refine and develop new treatments, techniques, devices and delivery systems**; we aid development and funding of innovation to move from concept to commercialization — even collaborating with the FDA to promote computational modeling for medical device applications.

Engineering remains the engine that powers progress in health, and we are dedicated to keeping it central to the conversation.



# ENGINEERING FOR CHANGE HIGHLIGHTS HEALTHIER PERSPECTIVES AND PROJECTS

The E4C webinar series proved one of the engineering world's most stimulating forums for the latest developments from the intersection of engineering and health:

## A MOBILE DEVICE MOVES HIV DIAGNOSIS AHEAD

Rwanda was the proving ground for a simple handheld device that diagnoses HIV through a pricked blood sample and wirelessly updates patients' medical records, in just 15 minutes. The **mChip device**, which uses less power than a cellphone, demonstrated comparable accuracy with laboratory-based ELISA (enzyme-linked immunosorbent assay) test kits, according to results published in the journal *Clinical Chemistry*.

## SOLAR STERILIZATION: AN ALTERNATIVE AUTOCLAVE

A team from Northern Arizona University created a **new solar autoclave design** to lower infection risk and enable thorough instrument sterilization in clinics in underdeveloped areas, a concept already endorsed by the WHO (World Health Organization). Featuring a reflective parabolic trough that lets the sun heat water and channels steam into a pressure cooker, the prototype can be made, maintained and replaced with materials that are widely available in remote areas.



**APPROXIMATELY  
3.5 MILLION  
PEOPLE DIE  
EACH YEAR DUE  
TO INADEQUATE  
WATER SUPPLY,  
SANITATION  
AND HYGIENE.**



Photo: Rob Goodier

**INDUSTRY DUMPS  
AN ESTIMATED  
300 - 400 MILLION  
TONS OF POLLUTED  
WASTE IN WATERS  
EVERY YEAR.**

**ONE IN NINE  
PEOPLE  
WORLDWIDE  
LACKS ACCESS  
TO IMPROVED  
SOURCES  
OF DRINKING  
WATER.**



**ONE IN THREE  
PEOPLE  
WORLDWIDE  
LACKS  
IMPROVED  
SANITATION.**



# MEDICAL PROJECTS SHINE AT ASME ISHOW

The ASME Innovation Showcase (IShow) enables the next generation of change agents from college teams to demonstrate their technical creativity and a business model to a judging panel of successful innovators, industry experts, venture capitalists and intellectual property specialists.

- Low-budget engineering virtuosos at MIT transformed a gearbox from an electric drill into a **hand-cranked, low-cost centrifuge** for clinical blood testing in the developing world.
- A Harvard team introduced the **ChemoPatch™**, a low-cost, disposable, and electronic patch-based cancer chemotherapy device designed for simple, automated use outside the hospital.
- The team from Washington University at St. Louis unveiled a **pocket-sized, low-cost spirometer** compatible with smartphones, empowering patients with asthma or other pulmonary diseases to track and manage their condition, while giving doctors real-time data to improve treatment.

The ASME IShow continues to demonstrate how deeply engineering students are engaged in health challenges. In fact, 40% of all team innovation submissions to the ASME IShow are in this field.

# ASME ISHOW



**PORTABLE,  
PERSONAL  
TECHNOLOGIES  
ENABLE LOW-COST  
HEALTHCARE  
INNOVATION.**

# 40%

**OF ALL ASME ISHOW  
TEAM APPLICATIONS  
ARE FOR INNOVATIONS  
IN THE MEDICAL/  
HEALTH FIELD**



## **THE 2ND ASME GLOBAL CONGRESS ON NANOENGINEERING FOR MEDICINE AND BIOLOGY**

NEMB 2013, held in Boston in February, featured 400 scientists, engineers, cell biologists, surgeons and clinicians from around the world. This exciting integration of engineering, materials science, and nanotechnology explored emerging technologies and showcased sharing potential medical applications.

Integrating expertise is the lifeblood of medical progress, and among the topics under discussion were: Bioengineering for Medical Diagnostics, Therapeutics and Imaging; Nano-/Microfluidics in Biology and Medicine (Analysis, Diagnostics and Therapeutics); Nanoengineering for Regenerative Medicine and Tissue Engineering; Biological Nanomechanics; and Materials Factors in Physiology, Disease and Treatment.

The convergence of disciplines is at the heart of medicine's future. And ASME is right there — convening, connecting and collaborating, in the laboratories, in universities, in hospitals, and in the field. Engineering is the pulse behind the development of the health solutions our evolving world needs. +



# TODAY, TOMORROW'S ENGINEERS AREN'T READY.



It's an indication of how quickly the world is moving that **by graduation, a new engineering student already has some catching up to do.**

By helping to bring the real world into the classroom ASME exerts an important influence on the education of the next generation of engineers.

**We support adding design-manufacturing experiences earlier in the core curriculum of foundational theory, research and practice.** This helps further align the engineering student's learning with industry readiness.

We are committed to fostering public awareness of the value of the profession, to optimizing the opportunities for engineering students, as well as **helping today's engineers enhance their capacity and effectiveness through ongoing training and credentialing.**

These are the best ways to equip tomorrow's workforce with tools to deal with problems we can't yet see or imagine — helping them achieve Global Impact.



## STUDENT COMPETITIONS HELP TEAMS PUT PRINCIPLES INTO PRACTICE

Team-based learning can supplement and strengthen engineering education by offering context, practicality and the opportunity to apply skills in a real-world situation. ASME runs several student competitions each year, and *Human Powered Vehicle Challenges (HPVC)* might be the most popular. *HPVC East* and *HPVC West* are must-see annual events in the U.S., and the program expanded to *HPVC Latin America* with its first event held in Caracas in 2013.

The first stage of the competition is the preparation of a comprehensive design report. The second part includes a demo: either a time trial or head-to-head drag race, and a 2.5 hour endurance race. The team from Universidad de Los Andes, Bogotá, Colombia, was the big 2013 winner, while the 14-member team from Instituto Tecnológico de Morelia placed second overall, and Instituto Tecnológico de Ciudad Juárez in Juárez, Mexico came in third. Plans to expand the program to India in 2014 are already underway.

## NEXT GENERATION SCIENCE STANDARDS

ASME supports the state-led *Next Generation Science Standards Writing Committee* that developed the new standards. The ASME Board on Education has been engaged throughout the NGSS process, providing input and comments on drafts. The new standards mark *the first time that engineering has been included in science standards for K-12 curricula in a significant way.*

The goal of the standards: “identify science and engineering practices and content that all K-12 students should master in order to be fully prepared for college, careers and citizenship.”

## EARLY INTRODUCTION OF DESIGN-BUILD EXPERIENCE CREATES A SMARTER, INDUSTRY-READY WORKFORCE.



# THE FUTURE STARTS WITH STEM

ASME's vision for a stronger engineering workforce rests upon the development of a larger, better prepared, and more diverse pipeline of pre-college students.

Our *K-12 STEM Education Initiative* delivers pre-college programs that **EMPOWER**, **ENABLE** and **INSPIRE** educators and students by providing tools, opportunities and information designed to make the "E" in STEM a reality in the classroom environment.

By focusing on K-12 STEM Education teachers, counselors, and parents, we can "influence the influencers" during curriculum change as school districts in the U.S. implement Next Generation Science Standards, including Engineering Design. Our opportunity to offer hands-on engineering experiences and personal insights to teachers and students is focused on two areas:

**Educator development** — equipping K-12 STEM educators with the knowledge and classroom tools to make the "E" in STEM a reality for themselves and their students.

**Awareness raising** — increasing recognition of the "E" in STEM in the K-12 classrooms, engaging with students directly through material that shows them (plus families, counselors, etc.) the possibilities of an engineering career.

**THERE ARE CURRENTLY BETWEEN TWO AND THREE MILLION UNFILLED POSITIONS IN STEM AREAS.**

**IN THE PAST 10 YEARS, STEM JOBS GREW AT 3 TIMES THE RATE OF NON-STEM JOBS.**

Source: [ngss.nsta.org](http://ngss.nsta.org), Appendix C: College and Career Readiness



# ENGAGING EDUCATION ABROAD

The data from the *Vision 2030* survey has become a catalyst to engage with groups in other countries in rethinking the education of engineers. By sharing the data, ASME is improving the dialogue and establishing common goals across different curriculums, age groups and continents.

In China, ASME is working with the China Association for Science and Technology (CAST), the Ministry of Education and the Chinese Mechanical Engineering Society (CMES) on incorporating global engineering education standards. This represents an important step in a nation that is expected to produce 1 million engineers a year in the very near future.

In the U.K., ASME joined with the Institution of Mechanical Engineers (IMechE) in a workshop on *Education and Skills for Manufacturing* which focused on [mapping the supply of engineering skills to demand, and improving the transition from education to employment.](#)

Through these collaborations, ASME is better able to identify how other nations and societies are approaching engineering education issues. Common themes emerge through these collaborations, including: a focus on pre-college and college; the need to incorporate codes and standards into coursework; more effective partnerships between employers and education; adapting education to utilize the way engineers learn; “best practice” teaching, including gender diversity; mentoring by professional engineers; industry partnerships to promote design-build experience in the undergraduate curriculum.

These efforts support our strategy: to prepare and promote a stronger engineering workforce worldwide, one that can confidently address our future challenges.

## DECISION POINT DIALOGUES ELEVATE EDUCATION DEBATE

ASME continues to direct and drive salient conversations. Our *Decision Point Dialogues* series is one such example. It’s designed to [engage the best minds from industry, government, academia and NGOs, and challenge them with some of the most complex questions facing engineers and technologists today.](#)

One example was a debate, entitled “*Will Engineers Be True Global Problem Solvers?*”. The discussion encompassed:

- Keeping university engineering programs up-to-date with the demands of the profession.
- Aligning technical expertise and local considerations to increase the success rate of projects in developing countries.
- The outsourcing of engineering and jobs.
- Increasing the number of women in the engineering workforce.





By taking an active role in engineering education, ASME cultivates a broader, more dynamic workforce with improved global awareness, practice readiness and innovative skills. The next generation of engineers also needs to reflect more closely the society it serves: with so few female engineers, we are under-representing half of the planet's populace. We'll need a more diverse, better-prepared, and better-connected workforce — if we are to have a better world. ▲

## VISION 2030

### ARE ENGINEERING GRADUATES REAL-WORLD READY?

This comprehensive ASME study of over 2,500 engineering managers, early career engineers, and 80 university mechanical engineering departments confirms just why we are working to advocate for more practice-oriented change in undergraduate degree programs. The main findings were a rather sobering window on what needs to be done to ensure a well-prepared future workforce.

- Several areas were named where graduate strengthening is needed, greater understanding of the realities of how devices are made and function together, improved communication skills, knowledge of industry codes and standards, systems thinking and project management.
- ASME has begun to spark voluntary engineering curriculum change and ABET accreditation criteria change, to infuse more engineering design-build flexibility into degree programs.

**YOUNG ENGINEERS SURVEYED FELT THEY NEEDED MORE PRACTICAL APPLICATION EXPERIENCE IN THEIR DEGREE PROGRAMS.**



**SINCE REDESIGNING  
ASME.ORG  
AROUND CONTENT  
AND COMMUNITY  
IN 2011, ASME  
HAS MORE THAN  
DOUBLED ITS  
REACH – NOW OVER  
**2 MILLION**  
VISITORS  
PER QUARTER.**



## A COMMUNITY CONNECTED TO CHANGE

The recent refinement and expansion of ASME's website supports our mission of Global Impact. Now the **new social networking features on asme.org** afford limitless potential for networking, knowledge sharing and collaborating with engineering professionals throughout the world.

Through this robust virtual global engineering community, we can realize its vision as the essential resource for mechanical engineers and other technical professionals for solutions that benefit humankind worldwide.

Facilitating dialogue and exchange on the latest technological developments, ASME Groups, public policy — even careers — the new site offers an online experience that harnesses the power of integrated intelligence.

A glance at this NASA satellite image of the world confirms the impact of engineering. **Each point of light effectively represents engineering at work: bringing not just energy, light and warmth to homes and businesses, but progress and possibility.**

Our global community enables each and every engineer out there to personally contribute to Global Impact. To illuminate, inspire and ignite the ideas that will build a brighter future for generations to come.

We invite you to join us at **ASME.ORG**