Building a Brighter Future

Partnering Universities:

U.S.-Pakistan Centers for Advanced Studies in Energy
Overview

The USAID funded USPCAS-E program is a partnership between Arizona State University (ASU) and two leading Pakistani universities: the National University of Sciences and Technology (NUST) and the University of Engineering and Technology (UET) Peshawar. The program aims to focus on applied research relevant to Pakistan’s energy needs, helps produce skilled graduates in the field of energy and serve as a bridge between government, industry and academia. Through this partnership, ASU is leveraging its expertise in higher education, applied research and energy to help Pakistan take advantage of enormous potential for economic growth through its universities.

Through technical assistance provided by ASU and under the umbrella of the Higher Education Commission (HEC) of Pakistan, the centers at both NUST and UET are expected to become Pakistan’s premier sustainable energy think tanks that will generate cost-effective and sustainable solutions for Pakistan’s energy challenges. Sound governance, modernized curriculum, teaching strategies and teaching methods will produce skilled graduates and applied research.

“Imagine losing power for up to 6-12 hours a day. Your connection to the world through the internet is severed. Your appliances cease to function. The air conditioning keeping your home comfortable cuts off. This is a reality faced by thousands of Pakistanis each day as rolling blackouts sweep through the nation regularly. Not only does this present socio-economic hurdles for the people of Pakistan, but it restricts economic growth and reduces foreign investment.

Together with partner universities National University of Science and Technology – Islamabad and the University of Engineering and Technology in Peshawar, we at Arizona State University’s Ira A. Fulton Schools of Engineering aim to address the energy needs of Pakistan through research, education and collaboration with government and industry.

In doing so, we hope to unlock Pakistan’s full economic potential, improve the quality of life nationwide and forge lasting relationships with our partnering universities.”

- Director, Dr. Sayfe Kiaei
The state of energy in Pakistan

For years, the matter of balancing Pakistan’s energy supply against demand has remained a largely unresolved matter. Pakistan faces a significant challenge in revamping its energy sector to meet the demand supply gap. Energy shortfalls have stunted the country’s economic growth and the increasing reliance on imported fuels to meet the demand supply gap has exacerbated the country’s trade deficit problems. With regards to installed generating capacity, Pakistan is ranked 201 out of 214 countries worldwide. 67.1 percent of Pakistan's electricity is from fossil fuels and country ranks number 33 globally in usage. Pakistan suffers from rolling blackouts and is currently in an energy crisis. Based on population and need, the country will quickly outgrow its already fragile energy system. The United States has sincere interest in making sure Pakistan's energy system is independent, stable and sustainable for the sake of security in the region and for the future of the Pakistani people.

The USAID program and USPCAS-E’s role within it

USPCAS-E is part of USAID’s larger $127 million U.S.-Pakistan Centers for Advanced Studies investment that aims to harness applied research to find innovative and practical solutions for Pakistan’s energy, water, agriculture, and food security challenges. The United States is committed to finding solutions to these challenges.

Energy at ASU

ASU is helping lead the transition to a future powered increasingly by renewable energy. Its expertise in developing knowledge leaders in order to transform energy systems is driven by strong training and implementation initiatives in Arizona and abroad. USPCAS-E is benefiting from the expertise and research of ASU’s multidisciplinary energy centers as well as their capabilities in training and stakeholder engagement.

“This new partnership presents a tremendous opportunity to help solve Pakistan's deepening energy challenges and identify new ways to develop more reliable power production.”

- Senator John McCain
**5 Core Goals**

**Governance**

USPCAS-E is focused on the collaboration between Pakistani partner universities and the Higher Education Commission of Pakistan in order to develop governance structures within these universities that allow for institutionalization and sustainability of each center for advanced studies.

**Curriculum reform**

ASU is supporting NUST and UET to develop curriculum that brings coursework and subject matter out of the classroom and into the public and private sector in a pragmatic and applied manner. The intent is to focus less theory and more on real-world application.

**Applied research**

The centers aim to carry out energy research that relates directly to ongoing and future energy challenges that affect the lives of ordinary Pakistanis and impede economic growth.

**Exchange programs**

USPCAS-E supports the academic advancement of Pakistani students and faculty, by hosting them at ASU for a semester to conduct energy research at our labs.

**Sustainability**

USPCAS-E seeks to strengthen the sustainability of initiatives at NUST and UET through fundraising strategies and the cultivation of public-private partnerships.
Warda Mushtaq and Syeda Mehwish are two examples of master’s students who came to Arizona State University as part of the USPCAS-E program. Supportive parents, a hunger or scientific knowledge and progressive academic programs have fueled their successes in engineering, a field dominated by men in Pakistan and most parts of the world. Warda said the USPCAS-E program jumpstarted her research career and has been “an amazing experience.”

Warda was so committed and excited about the opportunity USPCAS-E provided that she turned down a prestigious Fulbright doctoral program fellowship, offered by the United States Educational Foundation in Pakistan, to spend the semester at ASU. In addition to funding from USAID, Syeda won the British Council’s Scholarship for Women in Energy in 2013.

“I’ve always thought the focus of research should be on how something is going to affect your community, what the real-world application is,” Warda said. “I see a lot of that kind of purpose-driven research here [at ASU], and that’s something I look forward to applying back home.”

Both scholars aim to pursue doctoral degrees and have returned to Pakistan to continue their careers in advancing renewable energy.
Stakeholder Engagement

Fostering Partnerships, Fostering Sustainability

Stakeholders engagement is key to the sustainability of Pakistan’s higher education institutions in order to drive:

- Private sector innovation
- Modernization
- Strengthen government policy
- Stimulate economic growth
- Contribute solutions to Pakistan’s energy challenges

Through early and frequent engagement with stakeholders, USPCAS-E is ensuring relevant curricula and the development of research agendas that respond to private sector needs for the long term.
USPCAS-E is Opportunity

Opportunities for collaboration include:

- Sponsorship research for projects
- Internships
- Scholarships
- Enhancing value
- Faculty opportunities for research

“This partnership exemplifies ASU’s commitment to access, excellence and impact — not just in Arizona but also around the world.”

- Sethuraman “Panch” Panchanathan
  Senior Vice-President for Knowledge Enterprise Development at ASU
Cultural Exchange

Scholars Brighten Country and Lives

**The Human Component**
Technology and policy are not the only key points of the USPCAS-E initiative. Cultural exchange, soft skills, networking within the industry, as well as bringing disadvantaged students and women to the forefront of the energy field are all important components.

Saqib Sattar, who was a part of the first cohort of scholars, spent a great deal of time in the Photovoltaic Reliability Lab (PRL) last spring and had some advice for the most recent cohort of students. His said of his experience that, “Being an exchange student for research at ASU means that you will be exposed to a number of different (types of) equipment in the lab that will help you in learning many new things as well as getting hands-on experience. Also you will get the opportunity to meet with people from various cultures and will get to know about them and their culture. So my advice to the current exchange students at ASU is: this is a great opportunity for them not only to develop their technical skills but also soft skills which are very necessary nowadays to be successful in your field, so they should make full use of this once in a lifetime opportunity.” Current cohort student Hafiz Malik states that he is “loving this tapestry of cultures” that he sees at ASU and is looking forward to heeding Sattar’s advice.

Dr. Rabia Liaquat, who is faculty and part the Fall 2016 cohort of scholars, believes the total exchange experience benefits both countries and scholars economically, culturally and also improves the professional development of the participants. She said of the networking opportunities that, “ASU can help us to interact with other universities for the future,” and she feels that through the program they, “can connect with university fellows in our field.”

The students are agents of change for both countries and are part of a rising awareness of Pakistan’s energy challenges.
The efforts of USPCAS-E can help bring about a stable and prosperous Pakistan through research, education and innovation. This long-term investment in human lives echoes throughout the careers of the students, global political relationships and advances the field of energy research.

USPCAS-E creates:

- Robust student and faculty exchange programs between U.S. and Pakistani universities
- Strengthens university capacity to deliver quality applied research in energy
- Regular policy dialogues between public and private energy stakeholders
- Modernized curricula and teaching methods
- Establishes channels to facilitate local and international networking in the energy sector
- Increases access to energy-related professions for women and economically disadvantaged students

Outcomes

The efforts of USPCAS-E can help bring about a stable and prosperous Pakistan through research, education and innovation. This long-term investment in human lives echoes throughout the careers of the students, global political relationships and advances the field of energy research.

**Applied research projects, workshops and curriculum topics include:**

- Power systems
- Energy policy
- Solar photovoltaic systems
- Solar energy
- Thermal energy
- Energy materials
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