

U.S.-PAKISTAN CENTERS FOR ADVANCED STUDIES IN ENERGY

# ENERGIZER

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## FINDING HER PLACE IN THE SUN— AND HARNESSING IT FOR ENERGY

Meet USPCAS-E Scholar Muneeza Ahmad



**USAID**  
FROM THE AMERICAN PEOPLE

**ASU** Arizona State University



# USPCAS-E SCHOLAR PROFILE: MUNEEZA AHMAD



## FINDING HER PLACE IN THE SUN— AND HARNESSING IT FOR ENERGY

Muneeza Ahmad is from Lahore, Pakistan and is currently enrolled in the Energy Systems Engineering program at the U.S.-Pakistan Center for Advanced Studies (USPCAS-E) at the National University of Sciences and Technology (NUST).

Even as a young girl, Muneeza Ahmad always enjoyed science and mathematics so when it was time for college, engineering seemed like the best fit.

"I like to solve problems and look at things from new perspectives."

But Muneeza faced skepticism from her classmates about her decision to pursue engineering. Around the world, people still have a hard time picturing women when they hear the word "engineer."

"They used to say girls were not cut out for engineering and will not contribute to the field in the future. But I had the support of my teachers and was able to convince them with my performance in the classroom and lab," Muneeza says

### SCHOLARSHIP PROVIDES LIFE-CHANGING OPPORTUNITY

Muneeza was working at a manufacturing supply firm in Lahore when she heard about the Center for Advanced Study in Energy at NUST, but it was a long journey that involved saving enough money to pay the fees.

"I had been thinking about getting a master's degree for some time but due to the financial burden of my siblings' education, I couldn't ask my parents to pay for me. I saved up for a year to cover the application fee, first-semester tuition fees and hostel rent for my master's program. Fortunately, I was able to secure the USAID scholarship so I could focus on my education without having to worry about money."

One of the goals of the USAID funded U.S.-Pakistan Centers for Advanced Studies in Energy is to provide scholarships for promising students like Muneeza and create the highly educated energy-sector workforce that Pakistan needs to address its energy shortages.



## MAKING THE MOST OF THE EXCHANGE EXPERIENCE

Muneeza is part of the spring 2019 exchange cohort at Arizona State University (ASU). During the five-year life of the USPCAS-E project, over 200 Pakistani faculty and students visited the United States to be part of a research and cultural exchange program at either ASU or Oregon State University (OSU).

Exchange scholars are assigned to faculty mentors and work on research projects in their lab for a semester in addition to entrepreneurship and policy classes, business and social etiquette, and cultural and industry visits. Exchange scholars have described their experience as transformational. It opens up horizons and doors, creating depth in cross-cultural competency, expanding professional networks and increasing technical knowledge and experience.

"The best part is getting to meet new people. ASU has a diverse student body and I have made friends from all over the world. They have helped me cope with the homesickness and made the experience unforgettable."

"I value the guidance I have received from my mentors and fellow students at the Energy Materials lab. They are always ready to help me out whenever I struggled with something. They are very passionate about what they do, and I am trying to incorporate this mindset in my work ethic as well."

The focus of the exchange visit is on energy-related research in one of the engineering labs but it's not all work and no play. During their time in the U.S., the exchange scholars have the opportunity to experience ASU culture and history through a variety of activities and excursions. One of the popular outings has been the Arizona Renaissance Festival.

"I had the best time at the Arizona Renaissance Festival because we got to revisit history through an immersive experience. There were so many interesting people selling their wares, providing entertainment and holding demonstrations at the event. I was not expecting the festival to be that huge with so many things to see and do."

So, what does she enjoy when she's not hard at work in the lab?

"I love being outdoors and my favorite activity is hiking or cycling. When I want to relax and de-stress I like to curl up with a good book and travel to fictional faraway lands using my imagination."



*USPCAS-E Scholar Muneeza Ahmad in Dr. Zachary Holman's lab at ASU.*

## HARNESSING THE POWER OF THE SUN FOR ALL

In a place like Arizona where the sun shines almost every day, solar energy makes a lot of sense—but what about areas that do not get as much sunlight? Muneeza's research focuses on leveraging photovoltaics in diverse environments.

"We are designing a thermophotovoltaic cell that converts heat into electricity. It will have a carbon heat source that emits thermal radiation which will be converted into electricity which means the device can run even when there is no sun. In theory, this will make it possible for areas that do not get a lot of sunlight to enjoy the benefits of photovoltaic technology. I am trying to find the best material for the anti-reflective coating so none of the incoming energy is wasted and all of it gets transmitted into the cell. I am using modeling software to design the structure and then verifying the results with the FTIR (Fourier-transform infrared spectroscopy) and spectrophotometer tools in the lab."

After graduating Muneeza plans to work in a research lab to gain more experience in the field of materials so that she can contribute to cutting-edge research. And after that?

"In five years, I will be near to completing my Ph.D. degree, inshaa'Allah [God willing]," Muneeza says.



Some of the Spring 2019 exchange scholars celebrate with their research groups at a farewell event at ASU.

Seven cohorts of faculty and students visited the U.S. for exchange programs over the life of the project. In total, 217 exchange scholars completed a research and cultural exchange training program.

*Photos by Haute Media*







## FROM THE DIRECTOR

As we head into the last quarter of the funded portion of the USPCAS-E project, we are focusing primarily on the financial sustainability of the centers. Why is this important? We have invested heavily in creating new knowledge and a trained workforce. The centers have developed 14 new degree programs and 147 graduate-level courses in cutting-edge energy fields. About 900 students have enrolled in these programs, and more than 200 have earned degrees to date. More than 200 faculty and students have completed exchange programs. These opportunities for research training and cultural exchange have been transformational and will likely pay dividends for years to come. The center buildings at NUST and UET Peshawar provide 114,000 square feet of research and classroom space and include 16 state-of-the-art labs and two libraries. Outside financial support helps leverage these accomplishments and creates a virtuous cycle. Through funded research, training and testing services offered through their technology centers, both centers can sustain and continue these efforts. The centers have already reached their fund-raising targets through public-private partnerships and with the new technology centers offer the opportunity to create multiple revenue streams.

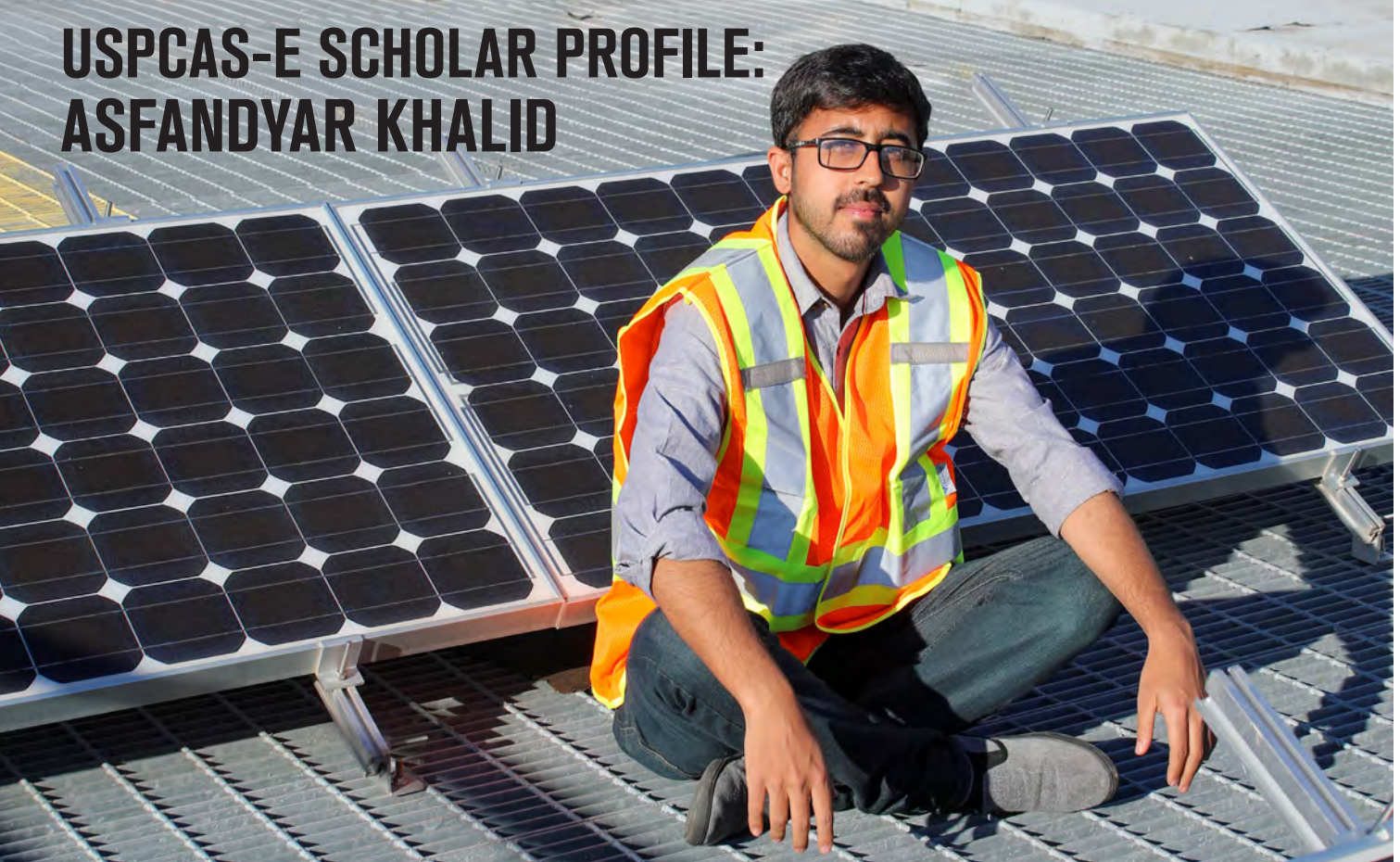
The project provided funding for 36 applied and 12 joint (U.S.-Pakistan) research projects to address pressing energy problems in Pakistan. These research projects have helped to create a culture of research but most importantly, research with directly applicable results that help communities and individuals flourish. Working together with Pakistan's Higher Education Commission, industry and government agencies, the centers can continue to identify critical grand challenges in energy. Together we can bring the unique strengths of academia to foster the development of research projects that will make an impact on Pakistan's energy landscape for the benefit of all.

**DR. SAYFE KIAEI** Project Director, USPCAS-E

*On April 29, Sayfe Kiaei celebrated the completion of the last exchange program with a farewell banquet for the spring 2019 USPCAS-E exchange scholars including Nisha Hareem pictured above.*

*Photo by Haute Media*

# USPCAS-E SCHOLAR PROFILE: ASFANDYAR KHALID



## TRANSFORMATIONAL EXCHANGE EXPERIENCE SETS SCHOLAR ON A PATH TO LEAD

USPCAS-E scholar Asfandiyar Khalid is a people person. He likes to meet new people and have conversations with them.

"It opens up my mind and I learn a lot from them and try to share my thoughts with them," he says.

So, it's no surprise that he wants to make things better for others.

"I always had this intuition that I want to invent new things, innovate ideas and play a key role in the advancement of my country. I wanted to serve my country and make life easy for the common man of Pakistan," Asfandiyar explains.

He worked for the Khyber Pakhtunkhwa Economic Zones Development and Management Company. He worked on designing the distribution system within an economic zone as well as maintaining the grids and systems of the existing systems.

Asfandiyar is from Peshawar. He is currently enrolled in the Electrical Energy Systems Engineering (EESE) program at U.S.-Pakistan Center for Advanced Studies in Energy (USPCAS-E) at UET Peshawar.

He was in the final year of his bachelor's degree program and serving as the president of the IEEE student organization at UET Peshawar when he learned about the USPCAS-E program.

"After seeing USPCAS-E's great standard of education, I enrolled in a master's degree program. I wished to be involved with USPCAS-E to try to help achieve its primary aim: solving the energy crisis in Pakistan."

Asfandiyar recently visited the United States as part of the USPCAS-E exchange program where he spent a semester working in Dr. Yang Weng's lab at Arizona State University. In addition to gaining intensive hands-on experience in the lab, he also learned about entrepreneurship, energy policy and U.S. culture.





"I always want to achieve excellence in whatever I do. This thirst for excellence has led to success many times in my life. An example of this is what I have achieved along with my colleagues here at ASU. We managed to build a prototype that will monitor the power flows from a solar PV system and this prototype is cheaper and remotely accessible, meaning I can monitor a system here at ASU back from Pakistan."

Asfandiyar knows that working toward a graduate degree and pursuing goals as an entrepreneur isn't easy.

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**"IT WASN'T EASY TO COME THIS FAR; YOU HAVE TO STRUGGLE CONSTANTLY," HE SAYS. "YOU HAVE TO OVERCOME YOUR FEAR OF FAILURE AND ALSO FOCUS ON SUCCESS; THAT'S THE WAY TO GO TO ACHIEVE GREAT THINGS."**

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Asfandiyar has a bit of advice to fellow students: "Stay thirsty for knowledge and try to quench that never-ending thirst, stay positive and committed towards your goals and work hard to achieve them."

When he's not in the lab, he loves to read, mostly history as he feels that history always teaches great lessons for the future. He also loves traveling and exploring nature.

Asfandiyar's favorite moments came during the spring break scholar excursion to various destinations in Arizona and California. He also enjoyed a visit to the Arizona Renaissance Festival.

"The best part of the exchange program was the people of the U.S. The cultural diversity was pretty amazing. I never felt away from home because people here are so loving and accepting."

The exchange experience was transformational for Asfandiyar.

"I guess I will never be the same person that I was before coming here. I have a different view of this world now. This trip exposed me to a great environment; one that has completely reshaped my thinking. Rather than being a follower, I now want to be a leader. I want to be an entrepreneur, an innovator."

And where does Asfandiyar see himself in the future?

After graduation, Asfandiyar wants to work for a government agency. He wants to use the expertise and knowledge he has gained from his exchange experience to help address Pakistan's energy crisis. He also wants to create his own startup company that would provide energy solutions as another way to benefit his people and his country.

"Five years from now I see myself as a successful entrepreneur who has made significant contributions in solving the issue of energy crisis in Pakistan. I see myself as an energy expert providing solutions to various energy problems."





## VISION AND TECHNOLOGY: UNIDO TAPS USPCAS-E TO EXPAND ENERGY OPTIONS

South Asia is cited as the major producer of biomass resources. This includes agricultural and livestock waste, wood residue from forests, and industrial wastewater from the agriculture industry. Thailand derives nearly one third of its energy from biomass using biomass gasification technology (BGT) leveraging agricultural waste. Through a controlled and enclosed burning process, BGT creates syngas, a fuel for electricity generators.

It's a cost-effective way to produce electricity while cutting down on the pollution from open agricultural trash burning. However, Pakistan hasn't significantly built out its biomass capability yet. That's why the United Nations Industrial Development Organization (UNIDO) funded the U.S.-Pakistan Center for Advanced Studies in Energy (USPCAS-E) at the National University of Sciences and Technology (NUST) to lay the groundwork for developing Pakistan's biomass energy capacity and to help generate interest for this energy source within the business community.

Scholars from USPCAS-E NUST won the grant in 2015 through a competitive bidding process. The success of that first project led to more collaboration. Most recently, USPCAS-E has been providing energy efficiency training and a demonstration facility that will show the potential users the research and technology in action.



## DISCOVERING THE POSSIBILITIES

Pakistani Small and Medium Enterprises (SMEs) need to know about biomass gasification technologies (BGT), says Muhammad Zubair, assistant professor of thermal energy engineering at USPCAS-E NUST and principal investigator on the biomass UNIDO projects.

“UNIDO thought it was better to do some capacity building before introducing gasifiers into the market,” he explains.

To accomplish the task, UNIDO awarded USPCAS-E a \$380,000 USD grant.

The project involved evaluating the energy requirements of SMEs in Pakistan – the potential users of gasifiers – as well as how these businesses currently meet their energy needs. That is, are they on the grid or using alternative means, such as diesel or gasoline generators? Can they shift to power systems based on biomass gasification technology?

Along with looking at the potential users, the team had to evaluate potential equipment and service providers who could build and help operate the systems. The researchers also identified financial resources to help businesses invest in BGT as well as potential supply chain resources for the raw agricultural by-products burned to make syngas.

“We have data about the feedstocks available in different regions of Pakistan,” Zubair says. “We have also documented the requirements of communities and SMEs and can show how much a business can save.”

For instance, the researchers found that a small business using a diesel or gasoline engine is spending six times more than the cost of a biomass gasification system (BGT). The cost of producing one unit of electricity from BGT ranges from 5-10 U.S. cents, depending on the cost of biomass feedstock.

Reports on these findings were only part of the results of this two-year effort. Zubair and his team – which included several students – created business plan templates to help businesses evaluate the investment and secure financing. The team also held workshops to promote biomass technology and created manuals for the laypeople who would use and run the facilities.

The NUST team also created curricula on BGT for undergraduate and master’s programs. They even developed curriculum for vocational training institutes to ensure that people of many educational levels could be ready to work in the BGT industry.

Then the team held an international conference to further educate the business community about BGT and to connect them to relevant resources.

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**“WE INVITED ALL THE COMPANIES RELATED TO BIOMASS ENERGY TO DISPLAY THEIR PROJECTS AND WE HAD A GOOD TURNOUT. THE CONFERENCE ALSO FACILITATED SEVERAL MEMORANDA OF UNDERSTANDING BETWEEN LOCAL AND INTERNATIONAL COMPANIES FOR TECHNOLOGY TRANSFER,” ZUBAIR SAYS.**

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## NURTURING GROWTH

For the second phase of this UNIDO-funded initiative, Zubair and USPCAS-E scholars are continuing their work of cataloging resources, educating businesses and documenting financial concerns related to BGT. They’re adding to their studies on supply chain and mapping out how to move agricultural by-products to the BGT plants that need them.

“A major component of this project is biomass cluster development,” Zubair notes.

A business or technology cluster is a concentration of interconnected and related suppliers, businesses and institutions focused on a specific technology in a geographic region. Technology clusters aim to harness resources, promote technology adoption and increase the productivity of cluster participants. California’s Silicon Valley is a prime example of a technology cluster.

In addition, Zubair’s current work includes a biomass demonstration project in a plywood factory. This facility serves as a showcase for other Pakistani business operators that demonstrates the benefits of these systems.

“They have wood chips and residues. We are now going to set up a 50-kilowatt system. We’ll provide the technical assistance and we’ll operate it. Then we’ll get the research data and have the patent for the system,” Zubair says.

“This will be our highest-scale project outside the academic environment,” he continues. “We’ll get more projects by demonstrating that successful project, so I’m hopeful it will help with sustainability” for the USPCAS-E program itself.



That is, consulting on BGT systems could become a healthy revenue generation source. According to Zubair, creating the technology cluster will be key to that effort, and USPCAS-E will be positioned as the hub.

## HELPING BUSINESSES MAKE MORE, USE LESS ENERGY

While the BGT projects are designed to help Pakistani businesses make their own power on site, prior work done by USPCAS-E scholars also earned them the opportunity to help teach businesses to use less energy overall.

That's important because, right now, Pakistan is seeking to adopt energy efficiency measures. For example, the textile industry makes up about 62 percent of Pakistan's exports and employs 45 percent of the total labor workforce. However, it could be more vital and profitable if it employed similar energy efficiency measures used by neighboring export competitors.

"The textile sector energy costs in India are one fifth of what they are in Pakistan," says Ali Qureshi, an expert in sustainability and biomass systems with the United Nations Industrial Development Organization (UNIDO). "In Bangladesh, the energy cost is one ninth of what it is in Pakistan."

High energy bills are putting Pakistan's largest export industry at a disadvantage, and that's one reason UNIDO is ramping up to deploy energy efficiency training on a wide scale.

## SPREADING THE WORD

Qureshi calls the recent training sessions "capacity building." Specifically, his organization is trying to build a pool of certified energy auditors and energy managers. Knowing where you currently stand through energy audits and then learning to mitigate waste are critical skills for cutting business costs and making Pakistani enterprises more competitive on the global stage. Significant savings can be realized through efficiency measures.

"Although there is potential for energy efficiency, almost 10 to 40 percent in typical buildings and industries in Pakistan, less than five percent of our organizations implement energy efficiency," says Muhammad Bilal Sajid, assistant professor of thermal energy engineering at USPCAS-E NUST.

As a starting point in this educational effort, the UNIDO team benchmarked Pakistani energy consumption in five key industrial sectors and compared them to potential energy savings via international best practices. Overall, they found that the Pakistani textile market could shave around seven percent off its energy expense, while the ceramics industry could save 10 times that number: 70 percent, says Qureshi. Paper and pulp product manufacturers could save 22 percent on their energy bills, TV manufacturers stand to save as much as 45 percent, while the foundry industry could cut 12 percent from its energy costs merely by optimizing processes associated with its coke ovens.





**“WE FOCUSED ON THESE FIVE SECTORS BECAUSE THERE IS A LOT OF POTENTIAL FOR ENERGY SAVINGS,” SAYS ALI QURESHI. “SINCE WE ARE GOING THROUGH AN ENERGY CRISIS, OUR FOCUS SHOULD BE ON THE ENERGY EFFICIENCY SIDE.”**

“Among the list of things that should be evaluated for savings potential, you’ll find lighting, motors, boilers, compressors, pumps and heating or air conditioning equipment,” Sajid says.

Motors, compressed air systems and building envelopes – the walls, windows, doors and other physical separators between a building’s conditioned and unconditioned spaces – are the areas where the savings reside, he adds.

### COMING UP TO STANDARDS

Along with teaching efficiency measures, the UNIDO program will teach continuous improvement similar to guidelines from the international organization for standardization.

“We are working on establishing an energy management system in industry that is in line with the international standard, ISO 50001 energy management systems,” says Qureshi.

UNIDO’s program also served as the foundation for a new elective course in NUST master’s program, Industrial Energy Management. This class draws directly from the UNIDO trainings, Sajid says.

That training reached approximately 20 people associated with the USPCAS-E program, as well as energy consultants, industry representatives and participants from the public sector. Many will continue with the program as trainers, consultants or participants in the ISO 50001 energy management system initiative. Together USPCAS-E and UNIDO aim to increase energy efficiency, reduce greenhouse gas emissions and create new job opportunities for Pakistan’s energy professionals.

*As of June 2019, USPCAS-E at UET Peshawar secured funding of \$50,000 under UNIDO’s energy management systems (EnMS) project for Khyber Pakhtunkhwa and Balochistan. Introducing a regional energy consortium model, the UNIDO—USPCAS-E partnership aims to develop a culture of EnMS and investments in energy efficiency through piloting EnMS and energy system optimization in around 50 organizations in Pakistan.*

# VIRTUAL SEMINAR: USING TECHNOLOGY TO MAP HYDROPOWER

Arizona State University organized a hydropower virtual seminar on April 23, 2019, for USPCAS-E scholars at UET Peshawar and NUST. Facilitated by Professor Kendra Sharp (Oregon State University), the seminar covered the assessment needs for small hydropower systems and the tools developed at OSU to improve the assessment process, particularly in terms of seasonal and long-term power stability as well as expected impacts of climate change on power availability.

Sharp stressed the need for distributed energy systems in Pakistan because of the rural-urban divide in electricity access. The seminar highlighted the key parameters needed to calculate power potential for a hydropower system and sources of data for these parameters of estimating hydropower resources.

Sharp touched upon the role of snow and glaciers as a water source over an annual cycle, as well as expected impacts of climate change. She also discussed the process and presented results from the application of Hydropower Assessment Tool (HPAT) to a series of study sites from an OSU-ASU-UET joint research project to show the changes in water availability over an annual cycle at these sites.

Ayesha, a participant, mentioned that the session was useful for her to learn about hydropower potential in Pakistan and identify places where abundant water resources are available.



Majid Khan, a Ph.D. student, remarked that the talk was not only beneficial for beginners in this field but also gave a bird's eye view of Pakistan's hydro potential from an international perspective.

The USAID-funded USPCAS-E program is building the capacity of its graduates in renewable energy and promoting the application of clean and green energy to address Pakistan's energy needs.

## PROMOTING EXPERIENTIAL LEARNING AT THE CENTERS

How do you transform the classroom experience and make the learning process engaging meaningful and relevant? How do you optimize learning? As part of its efforts, USPCAS-E is working with faculty and staff to transform the energy curriculum at its partner universities in Pakistan. ASU supported both partner universities in adopting the latest pedagogical practices to improve course delivery practices and enhance the learning experience. The six-month effort included classroom observations, a three-day pedagogy training, online modules and virtual Zoom sessions focusing on the scholarship of teaching and learning to provide actionable feedback to ensure that classroom instruction is on par with international best practices.

ASU worked with faculty at NUST and UET Peshawar to deepen their understanding of active learning approaches and improve their use of these approaches in the classroom. In the wrap-up session held on June 27, 2019, participants shared their findings and classroom practices.

Nine faculty and staff from NUST and UET Peshawar completed all program components and received a certificate of completion: Abdul Kashif Janjua, Nadia Shahzad, Muhammad Noman, Affaq Qamar, Khurshid Ahmad, Muhammad Hassan, Fahad Ullah, Muhammad Shoaib and Kaleem Ullah.





# VIRTUAL SEMINARS AND WORKSHOPS

Technical workshops and seminars led by international experts bring the latest techniques, tools and knowledge to faculty, staff, students and stakeholders in Pakistan. During the life of the USPCAS-E project, ASU facilitated 13 workshops and nine virtual seminars in Pakistan.

## TECHNICAL WORKSHOPS CONDUCTED IN PAKISTAN

Facilitator	Organization	Workshop Topic	Date
1. Sayfe Kiaei	ASU	Solar Photovoltaics	FY 2016: Q1, Oct. 2015
2. Clark Miller	ASU	Energy Policy	FY 2016: Q2, Mar. 2016
3. A.M. Kannan	ASU	Fuel Cells and Batteries	FY 2016: Q4, Jul. 2016
4. Harvey Bryan	ASU	Green Buildings	FY 2017: Q1, Dec. 2016
5. Chad Haines	ASU	Gender Equality	FY 2017: Q2, Mar. 2017
6. Govindasamy Tamizhmani	ASU	PV Certification and Reliability	FY 2017: Q3, Jun. 2017
7. Ken Mulligan	ASU	Tech. Entrepreneurship	FY 2017: Q4, Sep. 2017
8. Zachary Holman	ASU	Energy Materials	FY 2018: Q2, Feb. 2018
9. Alan Paul	Giant Angstrom	Proposal Writing	FY 2018: Q2, Feb. 2018
10. Lou Farina	Windmill Ridge Ventures	Corporate Engagement	FY 2018: Q3, Apr. 2018
11. Kendra Sharp	OSU	Hydro Energy	FY 2018: Q4, Sep. 2018
12. Peter Rillero	ASU	Advanced Instructional Methods	FY 2019: Q1, Oct. 2018
13. Dan Shunk	ASU	Leadership Training	FY 2019: Q2, Mar. 2019

## VIRTUAL SEMINARS

Facilitator	Organization	Seminar Topic	Date
1. George Karady	ASU	Reduction of lightning caused outages of high voltage transmission lines	FY17: Q1, Nov. 2016
2. A.M. Kannan	ASU	Hydrogen Economy: Problems and Prospects	FY 2017: Q2, Feb. 2017
3. Brian Fronk	OSU	Introduction to High Temperature Solar Thermal Power Generation	FY 2017: Q3, May 2017
4. Zachary Holman	ASU	Where will solar go next?	FY 2017: Q4, Sep. 2017
5. Govindasamy Tamizhmani	ASU	Solar Photovoltaics - Testing and Certifications	FY 2018: Q1, Dec. 2017
6. Clark Miller	ASU	Social drivers, dynamics, and outcomes of energy innovation	FY 2018: Q2, Mar. 2018
7. T-W. Lee	ASU	Technical Issues in Thermal Power Generation Systems	FY 2018: Q4, Sep. 2018
8. Ken Mulligan	ASU	Developing an Entrepreneurial Mindset	FY 2019: Q1, Dec. 2018
9. Kendra Sharp	OSU	Open-source Hydropower Assessment Tool (HPAT) Package	FY 2019: Q3, Apr. 2019

# CAREER FAIR BRINGS OPPORTUNITIES TO STUDENTS

## UET PESHAWAR CAREER FAIR ATTRACTS HUNDREDS OF GRADUATES

On April 10, 2019, the U.S.-Pakistan Center for Advanced Studies in Energy at University of Engineering and Technology (UET) Peshawar organized its first Youth Employment Expo 2019 for the youth of Khyber Pakhtunkhwa (KP), focusing on engineering, information technology (IT), and business. Held in collaboration with the KP IT Board, the World Bank Group, Sustainable Energy for Pakistan (SEP), Women in Renewable Energy (WIRE), ACCA Pakistan and Khawateen Rozgar Services, the event provided local students and graduates access to many career and employment opportunities.

Over 2,000 graduates interacted with representatives from about 60 private and public sector organizations at the expo. The event also provided two parallel sessions for youth to explore market demand and the required skillsets for successful careers. One session focused on resume writing, job search and interview skills while the second facilitated interaction with human resources professionals and interviews of potential candidates for jobs and internships.

Special Assistant to the Chief Minister KP for Science and Technology Kamran Bangash and Vice-Chancellor of UET Peshawar Dr. Iftikhar Hussain inaugurated the Youth Employment Expo 2019 and delivered motivational speeches to the audience.



A graduate shared, "This event was a great opportunity to connect with industry. I learned about the needs of the current job sector, and the capacity development sessions arranged here increased the young graduates' confidence in themselves."

# UET PESHAWAR NATIONAL CONFERENCE EXPLORES INVESTMENT SCOPE IN ENERGY SECTOR

On May 2, 2019, USPCAS-E UET Peshawar organized a day-long national conference in collaboration with the Khyber Pakhtunkhwa Energy and Power Department to explore investment opportunities in the energy sector.

The event brought together government officials, energy sector professionals, university researchers and representatives from donor agencies and private industries to discuss the province's energy resources.

The energy experts focused on public-private partnerships and presented policy recommendations to the government to facilitate sustainable development through innovative partnerships.







## USPCAS-E SCHOLARS VISIT KOHAT TEXTILE MILL

On June 18, 2019, USPCAS-E scholars from the University of Engineering and Technology, Peshawar visited the Kohat Textile Mill.

These scholars are currently enrolled in the master's program in Energy Management and Sustainability at USPCAS-E. The visit focused on the production process of cotton and synthetic yarn as well as the power system installed at the factory that is providing 4MW electric power to the mill.

They learned how this system is providing a localized source of power for the mill, with high fuel efficiency and a reduction in the energy loss associated with long-range electricity transmission.

The scholars also discussed the possibility of deploying an environmentally friendly heat recovery system to further reduce energy consumption at the mill.

USPCAS-E scholar Syed Faisal Shah said, "During the Q&A session with management, I learned about their corporate policy, environmental assessments and sustainable production. Some fruitful discussions were held on power factor improvement that may be helpful for minimizing their power losses and reducing inefficiencies."

Another scholar, Danish Shahzad, notes that such industrial tours bridge the gap between theory and practice and help students learn about real industry challenges.



### LOOK ONLINE FOR MORE

FIND LINKS TO VIDEOS, PHOTOS, EVENT INFORMATION AND MORE ON OUR WEBSITE, [USPCASE.ASU.EDU](http://USPCASE.ASU.EDU)

## ABOUT USPCAS-E

The U.S.-Pakistan Centers for Advanced Studies in Energy (USPCAS-E) is a five-year program implemented by partners National University of Sciences and Technology (NUST), University of Engineering and Technology (UET) Peshawar and Arizona State University (ASU).

The project focuses on applied research relevant to Pakistan's energy needs. The program has multiple goals including curriculum development, applied research, the establishment of new laboratories, and international visitor programs.

### Partnering Universities:



**ARIZONA STATE UNIVERSITY**  
**USPCASE.ASU.EDU**

### QUESTIONS AND MEDIA INQUIRIES:

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# IN THE NEXT ISSUE

## Training the Trainers for the Technology Centers at NUST and UET Peshawar

## Industrial visit gives students an inside look at energy usage and efficiency

