Dr. USAMA BIN PERWEZ
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The academic and research experience at NUST has provided a way through the complex maze of life at various levels. My stay in NUST has helped me inculcate academic skills as well as interpersonal and professional skills. With this kind of background, I have developed certain skill sets, which would prove my competence and credibility, which are desired in the institute. Given an opportunity to work as a professor, I would be able to use all my array of dispositions and would certainly prove my worth to the department and thus I would be able to contribute to the institute as a whole.

EDUCATION

Apr 2019-Jun 2023 **Osaka University, Japan**
PhD Energy Systems
- Thesis: Advancing bottom-up approach for the development of multi-scale building stock energy model.
- Japanese Government MEXT (Monbukagakusho) Research Scholarship for whole duration of PhD.
- A joint research collaboration with Shanghai Jiao Tong University (SJTU), China.

Sep 2014-Mar 2017 **National University of Sciences and Technology (NUST), Islamabad, Pakistan M.Sc. Mechanical Engineering**
- Rank: 1st (Gold Medalist).
- Graduated with honors based on academic performance with CGPA of **4.0/4.0.**
- Principal subjects covered: Computational Fluid Dynamics, Heat and Mass Transfer, Finite Element Methods, Continuum Mechanics, Non-linear Dynamics, Solar Thermal Systems, Optimization of Engineering Systems, Advance Engineering Mathematics.
- Fully funded NUST Scholarship for whole duration of M.Sc.
- NUST Rector high academic achiever 2016.

Jan 2012-May 2013 **University of Engineering and Technology (UET), Taxila, Pakistan**
M.Sc. Engineering Management
- Graduated with honors based on academic performance with CGPA of **3.6/4.0.**
- Principal subjects covered: Finance for Technical Managers, Engineering Project Management, Quality Improvement in Technical Concerns, Management of Technical Organizations and Practices, Problem Solving and Decision Making in Engineering Management.
- Merit Scholarship in 2nd and 3rd Semester.

Oct 2006-Aug 2010 **University of Engineering and Technology (UET), Taxila, Pakistan**
B.Sc. Mechanical Engineering
- Graduated with honors based (First Division) on academic performance with **74%.**
- Principal subjects covered: Energy Resources and Utilization, Power Plants, Internal Combustion Engines, Refrigeration and Air Conditioning, Gas Dynamics, Applied Thermodynamics, Fluid Mechanics, Engineering Economics and Optimization.

EXPERIENCE

Oct 2023-Present **National University of Sciences and Technology (NUST), Pakistan** **Islamabad**
Assistant Professor, Department of Mechanical Engineering, College of E&ME
- Teaching Renewable Energy Technologies and Thermodynamics.
- In-charge of Sustainable Energy Analytics Lab (SEAL).

Feb 2012-Mar 2019 **National University of Sciences and Technology (NUST), Pakistan** **Islamabad**

Lecturer, Department of Mechanical Engineering, College of E&ME

- Teaching Renewable Energy Technologies and Refrigeration & AC subjects to undergraduates.
- Assistant CPD (Continuing Professional Development) Coordinator, CEME NUST.
- Assistant R&D (Research & Development) Coordinator, Department of Mechanical Engineering.
- Sports Officer, Department of Mechanical Engineering.

Jul 2010-Feb 2012 **TOTAL OIL Pakistan (PVT) Ltd.** **Islamabad**

Executive (DS & Technical Services)

- TOTAL is the world's fourth largest oil and gas group with headquarters in France and a strong global presence in five continents (130 Countries) across the world. The job description was to provide lubrication solutions to industrial & automotive key account clients. This experience gave me an insight to API certification and SAE classification of Lubricants which have impact on performance level and energy conversation in automobiles & industrial equipment.

PERSONAL SKILLS AND COMPETENCIES

Linguistics: Mother tongue: Urdu, Other languages: English.

Technical Skills: EnergyPlus, HOMER, LEAP, R Programming, MATLAB, MATHEMATICA, ArcGIS, IBM SPSS Statistics, EViews, Tecplot 360, ANSYS CFX, ANSYS FLUENT, COMSOL, CREO, Pointwise, HTRi, COMPRESS, MS Office (Word, Excel, PowerPoint).

PROJECTS

- Development of national and local governments' carbon management system for building sector (Ministry of the Environment Japan, 2021-2023).
- The strategic partnership on smart city initiatives between Shanghai Jiao Tong University and Osaka University (2019-2021).
- The long-term demand analysis of 100% renewable regional power system (2018-2020).
- Development of flow focusing technique for generating droplet in a microfluidic device (2017-2018).
- Implementation of Chemical Kinetic Reaction model to quantify the DNA amplification within microfluidic PCR system (2016-2017).
- Free cooling investigation of Data Center (2014-2015).
- Development of LEAP model for Pakistan's electricity sector (2013-2015).
- Assessment of Lean thinking implementation in Industrial sector of Pakistan (2011-2012).
- Design & Development of light weight fuel efficient vehicle for Shell Eco Marathon Asia (2012, 2017-2018).
- Design & Fabrication of HDPE material-based POL barrel (Ministry of Defence, 2012-2016).
- Improvement in Design of tail gate for military ammo carrier truck (MVRDE, 2012-2013).

PUBLICATIONS (Total citations: 549, h-index: 12, i10-index: 12)

A. JOURNAL

1. Tariq Talha, Muhammad Talha, Shuli Liu, Abdur Rehman Mazhar, **Usama Perwez**, Muhammad Moiz, Ahtasham Afzal (2025). Experimental study of unglazed transpired solar collectors integrated with buildings in humid sub-tropics, Energy and Buildings, Vol. 339, 115767. (IF: 7.1, Q1 Journal)
2. **Usama Perwez**, Muhammad Haseeb Rasool, Imran Aziz, Usman Zia, (2025). UBEM-SER: Role of sufficiency, efficiency and renewable in the decarbonization of commercial building stock at city scale, Sustainable Cities and Society, 106214. (IF: 12, Q1 Journal)
3. Muhammad Haseeb Rasool, Onur Taylan, **Usama Perwez**, Canras Batunlu (2023). Comparative assessment of multi-objective optimization of hybrid energy storage system considering grid balancing, Renewable Energy, 119107. (IF: 8.7, Q1 Journal)
4. **Usama Perwez**, Keita Shono, Yohei Yamaguchi, Yoshiyuki Shimoda, (2023). Multi-scale UBEM-BIPV coupled approach for the assessment of carbon neutrality of commercial building stock, Energy and Buildings, 113086. (IF: 7.201, Q1 Journal)
5. Keita Shono, Yohei Yamaguchi, **Usama Perwez**, Tao Ma, Yanjun Dai, Yoshiyuki Shimoda, (2023). Large-scale building-integrated photovoltaics installation on building façades: Hourly resolution analysis using commercial building stock in Tokyo, Japan, Solar Energy, Vol. 253, pp. 137-153. (IF: 7.188, Q1 Journal)

6. Yohei Yamaguchi, Yuto Shoda, Shinya Yoshizawa, Tatsuya Imai, **Usama Perwez**, Yoshiyuki Shimoda, Yasuhiro Hayashi, (2023). Feasibility assessment of net zero-energy transformation of building stock using integrated synthetic population, building stock, and power distribution network framework, Applied Energy, Vol. 333, 120568. (IF: 11.446, Q1 Journal)
7. **Usama Perwez**, Yohei Yamaguchi, Tao Ma, Yanjun Dai, Yoshiyuki Shimoda, (2022). Multi-scale GIS-synthetic hybrid approach for the development of commercial building stock energy model, Applied Energy, Vol. 323, 119536. (IF: 11.446, Q1 Journal)
8. Muhammad Haseeb Rasool, **Usama Perwez**, Zakria Qadir, Syed Muhammad Hassan Ali, (2022). Scenario-based techno-reliability optimization of an off-grid hybrid renewable energy system: A multi-city study framework, Sustainable Energy Technologies and Assessments, Vol. 53, 102411. (IF: 7.632, Q1 Journal)
9. Arif Hussain, **Usama Perwez**, Kafait Ullah, Chul Hwan Kim, Nosheen Asghar, (2021). Long-term scenario pathways to assess the potential of best available technologies and cost reduction of avoided carbon emissions in an existing 100% renewable regional power system: A case study of Gilgit-Baltistan (GB), Pakistan, Energy, Vol. 221, 119855. (IF: 8.855, Q1 Journal)
10. **Usama Perwez**, Ahmed Sohail, Syed Fahad Hassan, Usman Zia, (2015). The long-term forecast of Pakistan's electricity supply and demand: An application of long range energy alternatives planning, Energy, Vol. 93, pp. 2423-2435. (IF: 4.844, Q1 Journal)
11. Syed Fahad Hassan, Musahib Ali, Attique Sajid, **Usama Perwez**, (2015). Free Cooling Investigation of SEECS Data Center, Energy Procedia, Vol. 75, pp. 1406-1412.
12. Syed Fahad Hassan, Musahib Ali, **Usama Perwez**, Attique Sajid, (2015). Free Cooling Investigation of RCMS Data Center, Energy Procedia, Vol. 75, pp. 1249-1254.
13. **Usama Perwez**, Ahmed Sohail, (2014). Forecasting of Pakistan's net electricity energy consumption on the basis of energy pathway scenarios, Energy Procedia, Vol. 61, pp. 2403-2411.
14. **Usama Perwez**, Ahmed Sohail, (2014). GHG emissions and monetary analysis of electric power sector of Pakistan: Alternative scenarios and it's implications, Energy Procedia, Vol. 61, pp. 2443-2449.

B. CONFERENCE

1. **Usama Perwez**, Yohei Yamaguchi, Yoshiyuki Shimoda, (2021). Cross-over analysis of building-stock modelling approaches for bottom-up engineering model, Proceedings of Building Simulation 2021: 17th Conference of IBPSA, pp. 1781-1788.
2. **Usama Perwez**, Yohei Yamaguchi, Yoshiyuki Shimoda, (2020). Development of geo-spatial building stock model for Japanese commercial buildings, Proceedings of Annual Conference of Society of Heating, Air-Conditioning and Sanitary Engineering (SHASE) Japan, Vol. 10, pp. 25-28.
3. **Usama Perwez**, Imran Aziz, Imran Akhtar, Tahir Zaidi, (2016). Thermal modeling and design analysis of a hybrid microdevice for continuous-flow PCR using one heater, In: Proceeding of the ASME 2016 International Mechanical Engineering Congress and Exposition, Vol. 10, pp. V010T13A038.
4. Imran Aziz, Imran Akhtar, **Usama Perwez**, Auwais Ahmed, (2016). Three dimensional flow investigation in one and a half stage axial turbine, In: Proceeding of the ASME 2016 International Mechanical Engineering Congress and Exposition, Vol. 1, pp. V001T03A027.
5. Muhammad Rafid Mahmood, **Usama Perwez**, Aamer Ahmed Baqai, (2013). Importance of Vendor and Manufacturer Relationship for Effective Lean Practices, 2013 Tsinghua International Design Management Symposium, Shenzhen, China. (IEEE Xplore)

REFERENCES

1. **Yoshiyuki Shimoda, PhD**
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   Division of Sustainable Energy and Environmental Engineering,
   Graduate School of Engineering,
   Osaka University,
   565-0871 Osaka, Japan.
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   Department of Mechanical Engineering,
   NUST College of Electrical and Mechanical Engineering,
   National University of Sciences and Technology,
   46000 Rawalpindi, Pakistan.
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