

TUSDEC

Technology Upgradation and Skill Development Company

NEWSLETTER
ISSUE 08

TECHNOLOGY BREAKTHROUGH

- > REINFORCED FIBER PLASTICS (RFPs)
REVOLUTIONIZING THE
CONVENTIONAL INDUSTRY
- > HOT SOLAR CELLS

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Muhammad Alamgir Chaudhry
CEO TUSDEC

TUSDEC WELCOMES ITS NEW CHIEF EXECUTIVE OFFICER

Mr. Muhammad Alamgir Chaudhry has recently joined Technology Upgradation & Skill Development Company (TUSDEC) as its Chief Executive Officer. Mr. Alamgir has 27 years of diversified experience at various key positions where he spearheaded SME Development related to technology up-gradation, enterprise development and project management. He also worked closely with stakeholders representing Federal / Provincial Governments, private sector and donors (World Bank, JICA, UNIDO, UNDP, GIZ etc.).

Before TUSDEC, he earned his reputation by serving in SMEDA, Ministry of Industries & Production, Government of Pakistan, Agriculture Department, Government of Punjab, Pakistan Industrial Technical Assistance Center (PITAC) and Punjab Vocational Training Council (PVTC) in an increasingly responsible positions. As CEO SMEDA, he led the process of institutional reforms at SMEDA that resulted in launch of new development initiatives and partnerships with stakeholders from private sector, as well as international development agencies.

Mr. Alamgir Ch. earned his Bachelors & Masters Degree in Mechanical Engineering from U.E.T., Lahore and also holds Advance Diploma in Business Management from London, UK under British Council Scholarship. He has also attended executive courses from the World's leading institutes including CASIN Switzerland, USQ Australia, ABE London UK and JPC Tokyo Japan etc.

THE VISION UNFOLDS

The global competitive business environment has produced innovative international trade challenges between developing and developed regions. Such challenges are affecting corporate strategic directions and changing manufacturing and business policies all over the World. For developing countries, like Pakistan, these challenges mean really extra efforts are required to survive in the current global competitive environment.

What I feel, in decades to come, the use of more advanced design and manufacturing technologies will certainly emerge to be a key source of competitive strength. Although, the advanced design and manufacturing technologies' advantages and capabilities are already known, problems regarding the management practice, from the technology planning to its implementation, represent the main obstacles to the effective and efficient use of such technologies especially in countries like Pakistan. Pakistan is rapidly losing its share in the international market which is obviously a critical issue for the Government. Although, technically trained cheap labour was a source of comparative advantage for Pakistan at one point but this factor alone no longer ensures competitiveness in the technologically stagnant manufacturing sector in Pakistan.

In short, TUSDEC feels that Pakistan is facing a problem of acute technological obsolescence. Therefore, there is a great need for a strategy for the industrial technology upgradation in Pakistan. For instance, examples of outstanding industrial achievements of newly emerging economies such as Taiwan and Korea are underpinned by the ability to master technological competencies. These countries acquired foreign technology from developed countries, during the early phase of technology development, and emerged as developers of their own indigenous technological capabilities. However, on the other hand, the present status of Pakistan's design and manufacturing sector not appears to be encouraging, with mostly obsolete technology being employed in our industrial sectors.

It is therefore, imperative to examine the technology trajectories of both advanced and developing countries which would present an overall scenario as to where Pakistan lies within, and ultimately without wasting further time, we need to adopt result oriented business strategies & technology policies which would eventually steer Pakistan to 'jump the curve' and catch up with the developed World.

TRANSFORMING TECHNOLOGY

ENGINEERING SUPPORT CENTRES

TUSDEC recently established three Common Facility Centres (CFCs) in Peshawar (KP), Hyderabad (Sindh) and Lasbella (Baluchistan), under the GoP five year initiative of SME Sector Development Programme (SDP) funded by the Asian Development Bank (ADB). These three state of the art facilities will eventually provide a common pool of targeted technologies, training & skill development, testing & inspection and process / technology related services for collective upgradation of groups / clusters of Small and Medium Enterprises (SMEs). The SMEs will use these centres to improve quality and add value to their products / processes and train their labour on modern manufacturing techniques.

PESHAWAR LIGHT ENGINEERING SUPPORT CENTER (PLEC)

Peshawar Light Engineering Centre is established by TUSDEC in partnership with Asian Development Bank (ADB). This centre will provide engineering industry of KP with modern design and fabrication solutions, training, technical assistance and consultancy in product manufacturing. It will work as a Common Facility Centre (CFC), Product Development Institute and Skill Development, Training and Designing Centre. The centre will enhance the skills of craftsmen on contemporary machinery and will equip them with latest manufacturing techniques.

Focused Industries:

Rubber and Plastic Goods, Match Manufacturing, Metal and Metal Products, Engineering and Electronic Goods, Auto Rickshaw & scooters/ Motor cycles, Hunting & Sporting Arms, Other Metal Aluminum Products Manufacturer

Facilitation to Industries:

CNC Vertical Machining Centre (VMC)
CNC Turning Centre, Wire Cut
EDM Machine, CNC Folder Press
CNC Pipe bender, Coordinate Measuring Machine
CNC Marking and Graving, Electroplating equipment
Tempering hardening furnace, Salt bath furnace
Muffle furnace, Conventional Machining Section,
Welding Section

Cost: Rs 261.54 / - Million



▶ **CONTACT US** Plot # 134-6,
CECOS Industrial Liaison Centre, Hayatabd Industrial
Estate Peshawar, Cell No 0301-8930865

LIGHT ENGINEERING UPGRADATION CENTRE FOR SMEs IN BALUCHISTAN (LEUC)

TUSDEC established another Light Engineering Upgradation Centre for SMEs in Baluchistan (LEUC) which will extend local industry with an opportunity to diversify their products with modern design, training, technical assistance and consultancy services. The centre will also have technical support centre including Mechanical / Fabrication Workshop, Electrical / Electronic Workshop, HVAC Workshop and Carpentries Manufacturing Workshop. The centre will have a services department for Equipment Manufacturing / Repair / Maintenance services for the targeted industry.

Focused Industries:

Automobile, Engineering (Auto parts, Steel & Products, Electrical Goods, Metal parts/products) and Plastics

Facilitation to Industries:

- **Precision Machines:**
CNC Vertical Machining Centre (VMC),
CNC Turning Centre, Wire Cut, EDM Machine, Injection Moulding Machine
- **Material Testing Lab:**
Profile projector, Microscope, Universal Tensile Testing machine, Charpy/Izod impact tester, Carbon Sulphur Determinator, Eddy Current Tester, UV/Vis Spectrophotometer
- **Conventional Machining Section**

Cost: 250.57 / - Million



▶ **CONTACT US** Plot No N – 10 A at Sector N, Hub Industrial & Trading Estate (HITE) HUB,
District, Lasbela, Balochistan, Cell No 0332-2219094

HYDERABAD ENGINEERING SUPPORT CENTRE

Technology Upgradation and Skill Development Company (TUSDEC) has established Hyderabad light engineering support centre (HESC) sponsored by Asian Development Bank in Hyderabad. It is a Common Facility Centre to provide support to engineering industry of Sindh with modern design, training, technical assistance and consultancy facilities in high precision manufacturing. The center will enhance the skills of craftsmen on contemporary machinery and will equip them with latest manufacturing techniques.

Focused Industries:

- Machinery Manufacturers
- Automobile (2-wheelers)
- Plastic & Metal Industry & other Manufacturing

Cost of the Project: Rs 257 / - Million

Facilitation to Industries:

- CNC Vertical Machining Centre (VMC)
- CNC Turning Centre
- CNC Injection Molding
- Universal Milling Machine (UMM)
- CNC Wire & EDM Machine
- Die Casting
- Tools and Cutter Grinder
- Cylindrical Grinding
- Electroplating equipment
- Tempering hardening furnace, Salt bath furnace, Muffle furnace



CNC Turning Center



Injection Molding Machine



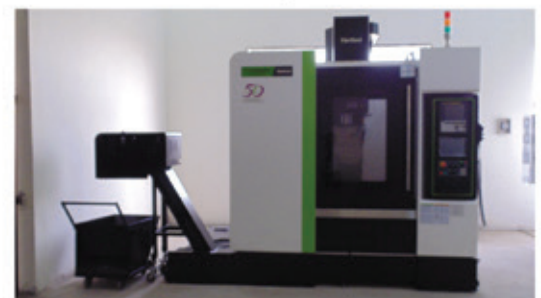
CNC EDM Machine



Radial Drilling Machine



Wire Cut Machine



CNC Vertical Machining Center

► **CONTACT US** Plot No. A-49 at small Industrial Estate Extension, Tando Muhammad Khan Road, Hyderabad Pakistan

MINISTER INDUSTRIES & PRODUCTION INAUGURATED HYDERABAD ENGINEERING SUPPORT CENTRE

The Federal Minister for Industries and Production Mr. Ghulam Murtaza Khan Jatoi inaugurated Hyderabad Light Engineering Support Center (HESC) on 28th April, 2017, Hyderabad. Technology Upgradation and Skill Development Company (TUSDEC) completed HESC with the cost of Rs. 257 million. The Federal Minister unveiled the plaque and took an informative tour of the facility. The project director, Ms. Sadia Masood briefed Mr. Ghulam Murtaza Khan Jatoi about HESC. She also explained in detail about the significance of the machines placed in HESC.

At this moment, Mr. Ghulam Murtaza Khan Jatoi said that the Ministry of Industries and Production is playing a pivotal role in industrializing Pakistan and it has entrusted TUSDEC to execute projects for other sectors in this context too. The minister also appraised the role of business community, HCCI and industry in supporting TUSDEC to complete this project. On the occasion, Federal Minister expressed his deep appreciation for establishing such a state-of-the-art light engineering facility and also appreciated TUSDEC's team for working days and nights to develop a high tech engineering support facility in Hyderabad.

The CEO TUSDEC Mr. Alamgir Chaudhry also shared his views about TUSDEC and specially operations of HESC. According to the CEO TUSDEC, the centre is fully furnished with the technology to develop modern design, training, technical assistance and consultancy in high precision manufacturing. The centre would also enhance the skills of craftsmen on contemporary machinery and will provide them with latest manufacturing techniques. HESC will be providing 1680 highly technical services annually to the industry. The Centre will also provide trainings to 1065 trainees annually.



TUSDEC COMPLETED PROJECTS

EU Funded Project, Supporting TVET Sector in KP and FATA

TUSDEC has concluded project “Supporting TVET Sector in KP and FATA” funded by the European Union. The project has trained more than 12,000 men and women in more than 65 demand driven trades. The project has also supported the successful trainees in employability. The employability ratio of the project is around 75% which includes the youth who have got employment in formal setups, informal micro level workshops, small businesses and self-employment. TUSDEC has worked with more than 150 Training Institutes to implement the project. The project has also worked to enhance the capacity of the selected training Institutes.

PROJECT CLOSING CEREMONY

The Project Closing Ceremony was held in Peshawar on 24th February, 2017. Mr. Bernard Francois – Minister Counselor, Delegation of the European Union to Pakistan was the Chief Guest, CEO TUSDEC Mr. Alamgir Chaudhry, Ms. Saadia Ainuddin- HRD Advisor, Delegation of the European Union to Pakistan, Mrs. Farah Hamid Khan, Secretary Industries Department, Govt. of KP, Mr. Haji Muhammad Javed-Chairman Skill Development Council, and Mr. Haji Muhammad Afzal- President Sarhad Chamber of Commerce and Industries were also present to grace the occasion. Representatives of TVET stakeholders including FATA development authority, KP-TEVTA, GiZ, training service providers, employers and micro finance institutes also attended the event.



The chief guest applauded the efforts of TUSDEC to train the youth of KP and FATA and reiterated to continue the support of EU for Pakistan. CEO TUSDEC Mr. Alamgir Chaudhry briefly apprised the audience about the initiatives being taken by TUSDEC to support the local industry and communities including project achievements. He thanked European Union for funding this project and admired the efforts of EU. The dignitaries and project staff were awarded shields at the end as a token of appreciation by TUSDEC.

DELIVERABLES ACHIEVED

Female and Male Trainees Trained:
More than 12,000

Vocational Trades: 65

Institutions Upgraded: 05

Job Placement: 9043

Micro Financial Assistance: PKR 2.64 Million

Beneficiaries: 130



FATA Transition AND RECOVERY PROGRAM - UNDP

The project was designed to provide training to 625 male and female locals of Bara, Khyber Agency. The project aimed to equip the natives with demand oriented technical skills along with job placement/market linkages support to become earning hands of their families.

Target Group: Vulnerable youth and women

Cost : PKR 27 Million

Outputs/Impact: Trainings provided to 625 marginalized youth, men and women of the area in demand oriented trades i:e (Jewelry making, hand embroidery, building electrician, solar and UPS technician, home appliance repair, plumbing). Trainees were also facilitated with tool kits.

Post Training Services:

Provided career guidance through career counselling sessions

Focus on entrepreneurship

Conducted market survey to collect data of potential employers

Product display and certificate distribution ceremony for market linkages



Women's Empowerment through Crafts, ENTREPRENEURSHIP AND TECHNOLOGY

TUSDEC partners with British Council for research study on Women's Empowerment through Craft, Entrepreneurship and Technology. The research aims to identify potential partners in Pakistan, including organizations already operating in crafts sector and potential sources of funding for future programmes. The research identified need and opportunity for the British Council to develop projects in the craft sector.

Objectives of Research:

1. To provide craft and entrepreneurship landscape broadly and in relation to female communities.
2. To understand the skills gaps and labor shortage affecting the crafts sector, including any differences or similarities across countries.
3. To identify key players in relation to the skill gaps and shortages; outline market demand for their products.
4. To identify potential partners and possible co-investors for future Programme development.
5. To assess the role of digital technology in the work of the key players – consider whether there are any key players using technology, specifically mobile and digital technology to advance their work.

Duration: 3 months

Partner: The British Council

TUSDEC TRAINING & TESTING SERVICES

NATIONAL INSTITUTE OF DESIGN & ANALYSIS (NIDA)

Globally the product development avenue has been evolved from merely tangible to precisely conceptualized, guiding the actual product formation. To sustain and excel in this technological revolt, it is imperative for the Pakistani manufacturers to persistently enhance their skill banks in Computer Aided Design and Manufacturing. Effectively addressing the issue, TUSDEC has played an effective role in 'bridging this digital divide' by setting up NIDA centers in Lahore, Karachi, Peshawar, Sialkot and Quetta as five advanced CAD/CAM/CAE training institutes. The courses cover basic to advanced design techniques applicable in all industry segments -mechanical, electrical, civil, process plant, process, energy sector, garment, fashion, jewelry and the array reaches infinity.

Target Group:

Manufacturing concerns, Industry Professionals, Engineers, Students, Marginalized Youth

Outputs/Impact:

5 Centers trained more than 16,500 Industry Professionals, Engineers, Students, and marginalized Youth

Major clients: NDC, PAEC, KRL, HMC, Fatima Fertilizer, Fauji Fertilizer, KSB, Millat Tractors, DESCON

Recent Training Activities:

NIDA Lahore has conducted 3 on-site trainings for OMV (PAKISTAN) in Total Productive Maintenance, Process Design & Analysis, Fundamentals of Oilfield & Drilling Operations.

Product Design & Development Services – NIDA

1. Designing of 3D models using latest CAD licensed softwares
2. Product designing using CAD tools
3. 3D Inspection Services for Production parts
4. Mechanical components part & assembly designing/ verification
5. Static Stress Analysis of mechanical components using CAE licensed software
6. Reverse Engineering services using BACES 3D scanner

Outputs/Impact:

- Performed 1610 Product designing and development jobs and generated revenue of PKR 5.68 Million
- Services provided to more than 100 clients including Haier, Ravi autos, Chenab Engineering etc for manufacturing parts.

CEMENT RESEARCH & DEVELOPMENT INSTITUTE (CR&DI)

CR&DI is achieving milestones and getting self-sustainable through providing quality testing facilities for cement and allied materials compliant to national and international standards.

Materials Tested

Cement(OPC, SRC, White, Blended), Fly Ash, Silica Fumes, Slag, Concrete Pavers, Grout, Clinker Dolomite, Iron Ore, Gypsum, Fire Bricks.

Performance Analysis

CR&DI achieved highest number of Samples (969) tested in Year 2016—2017 and earned highest ever revenue in this fiscal year.

CR&DI Physical Section Upgradation

Physical Section upgraded with respect to relevant Standards (ASTM, EN, ISS, PSS) with controlled temperature requirements.

Planning to start EDTA CHEMICAL Analysis in near future

CR&DI is planning to start EDTA Chemical Analysis method in near future. Old method require about 5 hours for chemical analysis but EDTA method will take only 3 hours for complete chemical analysis which will increase efficiency.

Outputs/Impact

- Total sample tested 6266 and has generated a revenue of around PKR 37.8Millions



TECHNOLOGY BREAKTHROUGH

REINFORCED FIBER PLASTICS REVOLUTIONIZING THE CONVENTIONAL INDUSTRY

BE STRONGER, SMALLER AND SMARTER

Carbon Fiber Reinforced Plastic (CFRP), is a very strong and light composite material or fiber-reinforced plastic and fast replacing the conventional materials. Fiber-reinforced composite materials have gained popularity (despite their generally high cost) in high-performance products that need to be lightweight, yet strong enough to take harsh loading conditions such as aerospace components (tails, wings, fuselages, propellers), boat and scull hulls, bicycle frames and racing car bodies.

AUTOMOBILE INDUSTRY ADOPTING COMPOSITE MATERIAL-VOLVO USES COMPOSITE PARTS

Automotive giant Volvo reports that it is adopting high performance, lightweight composite transverse leaf springs for more models following their introduction several months ago on its XC90 SUV. Volvo is now also using the parts in its S90 sedan and V90 station wagon models.

The leaf spring is made using Loctite MAX 2 flagship two-component polyurethane composite matrix resin system from chemical company Henkel, produced by composite specialist Benteler-SGL using high-speed resin transfer molding (RTM). Total volumes could reach close to 200,000 per year.

In all three car models, the transverse leaf spring incorporated into the rear suspension saves 4.5 kg compared to steel coil springs normally used in cars, leading to a reported improvement in fuel efficiency and a reduction in carbon dioxide emissions. The leaf spring also helps provide a smoother ride and improved NVH (noise, vibration, harshness) behavior. By eliminating coil springs that would otherwise protrude into the trunk area, the transverse leaf spring leaves more space for luggage.



LONG FIBER REINFORCED THERMOPLASTIC COMPOSITE MATERIAL FOR SPORTS

- Reduce athlete fatigue with lighter weight materials
- Increase strength for superior performance without compromising toughness.

CARBON-FIBER TALL BUILDINGS A REALITY NOW

Carbon Fiber Reinforced Plastics (CFRP) in civil and structural engineering have been used in retrofitting, where long, narrow sheets are bonded to the soffits of slabs and beams to enhance their flexural strength. Other applications include the external bonding of larger sheets as a wrap to enhance shear capacity, and achieving seismic resistance in buildings and bridges that are otherwise below target performance. CFRP is one of a family of advanced construction materials that is combined with thermoplastic polymers to achieve a composite.

The attractiveness of CFRP often centers on the strength benefits. But the best applications are found where reduced material ductility does not compromise safety.

Brittle failure and comparably low fatigue resistance are disadvantages when considered in conjunction with civil and structural engineering uses. Some tall building designs endeavor to maximize the concentration of permanent gravity load to resist overturning, often addressed by mega columns. Traditionally, these become large reinforced-concrete elements, often with embedded steel sections acting as mechanisms for the transfer of vertical forces at key positions for delivery to the foundations. Normally the longest and most continuous element in the building, the columns always receive a lot of attention in design, with focus on short- and long-term shortening from concrete hydration and from load. Research activity has focused on the use of steel and carbon fiber in the outer skin of composite columns. This work looks to take benefits from construction speed and visual qualities.



Source: <http://www.ctbuh.org/>



NEW TECHNOLOGIES WHICH WILL AFFECT YOUR ORGANIZATION, YOUR CAREER AND YOUR LIFE

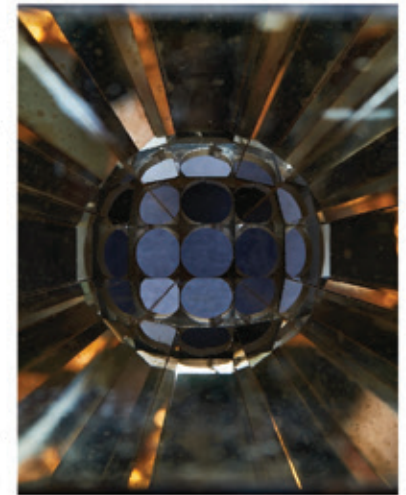
HOT SOLAR CELLS

By converting heat to focused beams of light, a new solar device could create cheap and continuous power.

By James Temple

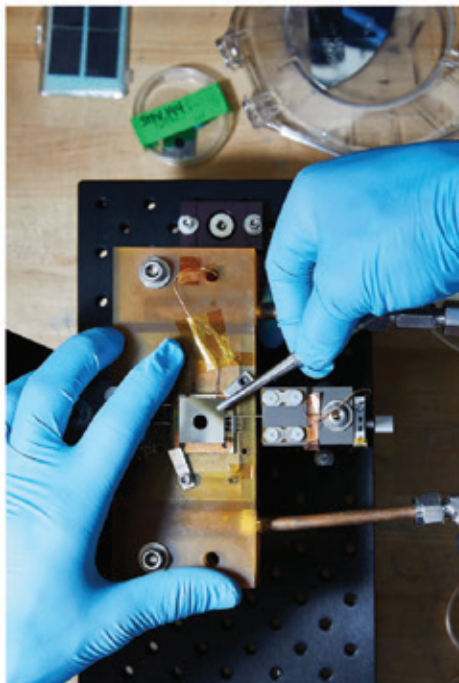
Courtesy: Technology Review (www.technologyreview.com)

Solar panels cover a growing number of rooftops, but even decades after they were first developed, the slabs of silicon remain bulky, expensive, and inefficient. Fundamental limitations prevent these conventional photovoltaic from absorbing more than a fraction of the energy in sunlight. But a team of MIT scientists has built a different sort of solar energy device that uses inventive engineering and advances in materials science to capture far more of the sun's energy. The trick is to first turn sunlight into heat and then convert it back into light, but now focused within the spectrum that solar cells can use. While various researchers have been working for years on so-called solar thermo photovoltaic, the MIT device is the first one to absorb more energy than its photovoltaic cell alone, demonstrating that the approach could dramatically increase efficiency.



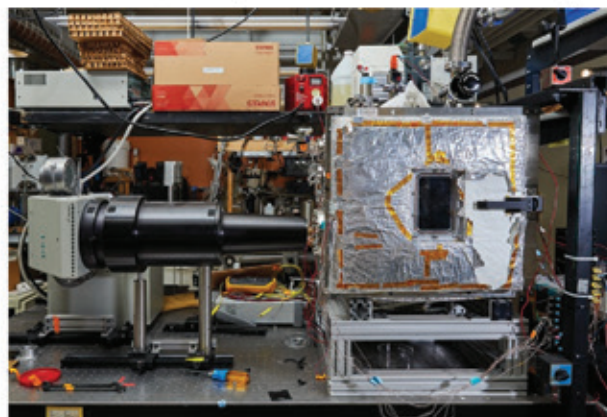
Standard silicon solar cells mainly capture the visual light from violet to red. Other factors mean that they can never turn more than around 32 percent of the energy in sunlight into electricity. The MIT device is still a crude prototype, operating at just 6.8 percent efficiency—but with various enhancements it could be roughly twice as efficient as conventional photovoltaic.

The key step in creating the device was the development of something called an absorber-emitter. It essentially acts as a light funnel above the solar cells. The absorbing layer is built from solid black carbon nanotubes that capture all the energy in sunlight and convert most of it into heat. As temperatures reach around 1,000 °C, the adjacent emitting layer radiates that energy back out as light, now mostly narrowed to bands that the photovoltaic cells can absorb. The emitter is made from a photonic crystal, a structure that can be designed at the nanoscale to control which wavelengths of light flow through it. Another critical advancement was the addition of a highly specialized optical filter that transmits the tailored light while reflecting nearly all the unusable photons back. This “photon recycling” produces more than heat, which generates more of the light that the solar cell can absorb, improving the efficiency of the system.



The absorber-emitter layer is situated above an optical filter and photovoltaic cell, which is visible underneath.

The researchers are also exploring ways to take advantage of another strength of solar thermophotovoltaics. Because heat is easier to store than electricity, it should be possible to divert excess amounts generated by the device to a thermal storage system, which could then be used to produce electricity even when the sun isn't shining. If the researchers can incorporate a storage device and ratchet up efficiency levels, the system could one day deliver clean, cheap—and continuous—solar power.



Concentrated light from a solar simulator shines through the window of a vacuum chamber, where it reaches the solar thermophotovoltaic device and generates electricity.

Further Information
<https://www.technologyreview.com/s/603497/10-breakthrough-technologies-2017-hot-solar-cells/>



Dr. Rafiq Ur Rehman PhD (USA)

Dr. Muhammad Rafiq-ur-Rehman did his MSc Agricultural Engineering Degree from University of Manitoba Canada in 1978 and completed his PhD in Agricultural Engineering from Clemson University, South Carolina, USA, 1990. He has served as Director General Agriculture (Field/Engineering), Government of Punjab.

IMPORTANCE OF REVERSE ENGINEERING FOR AGRICULTURAL MACHINERY AND IMPLEMENTS MANUFACTURING INDUSTRY

According to Pakistan Agricultural Machinery and Implements Manufacturers' Association (PAMIMA), there are more than 500 manufacturers of agricultural machinery and implements spread throughout the Punjab. Most of the manufacturing units fall under the category of assemblers who purchase components from the vendors and assemble the machines and implements. Only couple of hundred units can be categorized as manufacturers who have in-house manufacturing facilities. Such manufacturing units are located in the form of clusters in Faisalabad, Lahore, Daska, Mianchannu, Multan and Rahim Yar Khan.

Almost all the assemblers and manufacturers are producing farm machinery and implements for soil preparation, sowing and planting, weeding and inter-culture, pesticide spraying, harvesting and threshing machines for wheat (reapers and threshers), harvesting machines for potato, shellers and decorticators for paddy, groundnut and corn and machinery for post-harvest handling and processing. The quality of locally produced implements and machines is not up to the mark in terms of performance, efficiency, and cost of production as well as cost of operation. Some of the reasons that these were copied from the imported products during sixties without paying any attention to engineering

details, some of the important features were left out because either the manufacturer did not had the capacity to produce those or these were too expensive to be incorporated and lack of standardization.

Reverse Engineering (RE) is an established technique to gain knowledge about an original product (a part, component, sub-assembly, system or even a machine) and reproduce its carbon copy to perform exactly the same function without actually copying the original product. The objective of RE is to use the resulting knowledge gained through the reverse-engineering process that can then be applied to produce similar products through capitalizing on successes and learning from the shortcomings of original design. The process of RE essentially requires use of Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). In the first step, three dimensional position data of the object is obtained using laser scanners to create parametric surfaces.

In the era of precision agriculture technologies, use of automation, machine vision, drones/UAVs and robotics is playing pivotal role. Similarly, use of electronic and hydraulic systems is extensively being used in place of mechanical power transmission in precision agriculture technologies.

TUSDEC IS FACILITATING LOCAL INDUSTRY IN REVERSE ENGINEERING / PRODUCT DEVELOPMENT

The only possible way to overcome the identified problems of poor quality of locally produced farm machinery and implements is to import latest and state of the art farm machines and implements specially those for precision agriculture, disassemble the machine, study and document working details, produce prototypes through RE and assist the manufacturers in commercial production of more efficient and economical machines and implements meeting international/national quality standards.

Keeping the above in view and to stay competitive in the regional and international market, our local industry ought to produce machinery and implements which require lowest possible operating power and energy, have longer life with less breakdowns, have higher field capacity with wider swath, lower cost of operation and above all quality standards. In order to meet these challenges, the outlined strategy needs to be promoted with the collaboration of all the stakeholders.

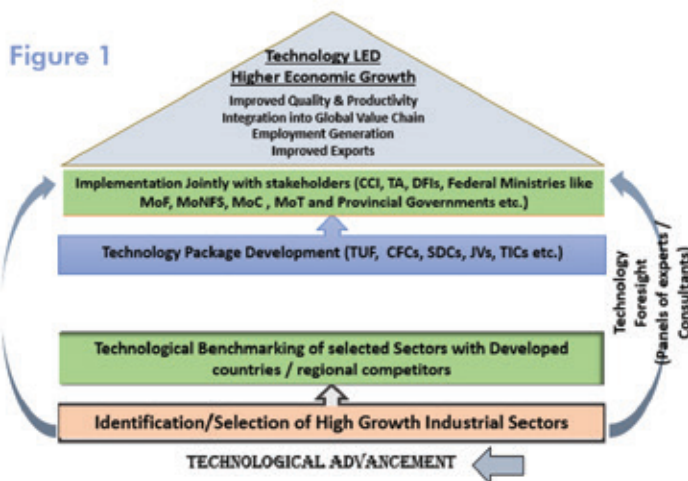


Further Information: Tel: (+92)-42-111-000-143 (Ext:230)
E-mail: info@tusdec.org.pk Website: www.tusdec.org.pk

INDUSTRIAL TECHNOLOGY BENCHMARKING

Technology led industrial development has been the main stay behind the economic growth of many developed and regional competitive countries in the recent past. Countries around the world adopt different technique for industrial development like Brazil developed 14 sectorial funds that are supporting technology development. Pakistan ranks 119 in Technological Readiness in world ranking on technology status. Pakistan is facing slow growth rates of output and exports, low levels of investment, technical inefficiencies, poor quality, low R&D activities resulting in lower productivity and uncompetitive Pakistani products.

International trends that currently shape the development of technology are “convergence of technologies”, “digitization through ICT” , “High Technology Industries” & “Recognition of Importance of Transnational Corporations” to develop policies and conduct R&D. To address the need of technology advancement TUSDEC is implementing a project of Industrial Benchmarking for priority sectors of Pakistan. Benchmarking Model is shown in **Figure 1**



FOOTWEAR CLUSTER DEVELOPMENT THROUGH CAD/CAM & CNC MACHINING

There is an immense export potential in the footwear industry of Pakistan, but it also faces many obstacles. The main obstacle is time-consuming nature of product development, for which new tools and material are required. TUSDEC initiated a Need Assessment Survey on the proposed establishment of the Footwear Product Development Centre. The goal of the survey was to ascertain the feasibility of the proposed centre and to verify the elements (production services and human resource development) that are to be incorporated into it.

The proposed centre, will be designed to cater all needs of the footwear products industry & the retail sector such as human resource, Product development, design, etc., and will be a landmark in the development of footwear sector of Pakistan. Some specific objectives are as under;

- Creating skilled Human Resource within the country by imparting appropriate knowledge and skills to promote growth of footwear industry and Retail industry in the country by incorporating different levels of trainings.
- The centre will facilitate the footwear manufacturers with state of art services for mold making.

DESIGN ASSISTANCE FACILITY (Reverse Engineering Services for Agriculture Machinery/Implements in Southern Punjab)

TUSDEC has carried out an assessment study in which it is analyzed that SMEs involved in Agriculture Implements and Ginning machinery in Southern Punjab are facing issues of low quality production, lack of knowledge about designs, materials, quality, standardization, relevant technology and production. TUSDEC plans to set up “Design Assistance Facility (DAF)” in Multan, Pakistan. This facility can produce standard drawings and CAD/CAM models and analyze the designs for the selected implements within specified timelines with the help of CMM and Designing software. A dedicated team of design engineers would be engaged for the aforementioned purpose. The proposed facility will serve initially 1,192 samples in 3 years.

What DAF will do?

- Reverse engineering through scanning of complex parts.
- Development of standardized 2D and 3D engineering designs of agri-implements
- Standardization of parts and sub-assemblies
- Development of assembly and sub assembly drawings
- Development of inspection jigs and fixtures to ensure conformance to the design specifications of implements
- Development of Computer Aided Engineering (CAE) data i.e. stress analysis reports, fit function testing reports etc.
- Ease of design optimization of agri implements according to local soil conditions
- Overall uplift of the agricultural implements manufacturing sector.

FUTURE INITIATIVES

STRATEGIC PLAN FOR TECHNOLOGY UPGRADATION IN PAKISTAN



In the face of growing economic and global significance of technology, it is becoming increasingly apparent that the development of technology is a key contributing factor for the growth of economy.

Rapid technical change, shrinking economic distance, new forms of industrial organization, tighter links between national value chains and widespread policy liberalization, are all altering radically the environment facing developing country enterprises. Competition now arises with great intensity from practically anywhere in the World. It is based on a bewildering array of new technologies. It calls for a range of new and advanced skills and sophisticated supply-chain and distribution techniques. Manufacturing is becoming more information-intensive: growing parts of value added consist of 'weightless' activities like research, design, engineering, marketing and networking. To compete, enterprises must use new technologies and organizational methods as best practice and link up to global value chains.

Pakistan ranks 119 in Technological Readiness, 132 in Labour Market Efficiency, 124 in Higher Education & Training in world ranking. Pakistan is facing slow growth rates of output and exports, low levels of investment, technical inefficiencies, poor quality, low R&D activities resulting in lower productivity and uncompetitive Pakistani products. Currently, world trade is dominated by High & Medium Tech exports (60%) to meet the customer demand. As long as in case of Pakistan, manufacturing sector exports still crowded by low-end products which account for more than 70% of total exports.

The challenge for Pakistan is to ensure the selective acquisition of developed technology, in such a way that results in both efficient production and a gradual increase in domestic technological capabilities. On the basis of stakeholder meetings and current industrial status, it is imperative that effective strategic plan to be devised for intervention be initiated to bring a systematic approach for developing the industrial technological capabilities.

Pakistan may bring workable strategic plan for Industrial technology acquisition in order to upgrade its industrial sectors capability by importing developed technology; injecting improvements in its endogenous and traditional technologies, and subsequently developing its ITC Indigenous Technological Capability(ITC) for strong assimilation. India Technology Vision 2035, India TIFAC Model, ITPO, Japan, Korea etc. ECO Vision 2025, STPF Pakistan, S&T Policy 2012 Pakistan, and Textile Policy 2014-19 Pakistan: these technology models have been studied & consulted and subsequently comparison of key features of these models has been developed by TUSDEC.

MAIN INTERVENTIONS OF THE PROPOSED PLAN

- Creation of Technology Upgradation Fund (TUF)
- Establishment of Skill Development Centers (SDCs)
- Establishment of Technology Incubation Centers (TICs)
- Establishment of Technology Upgradation Centers (TUCs)
- Establishment of Joint Ventures (JVs)
- Establishment of Regional ITPO Offices

This would thus enable Pakistan to ultimately become a producer of state-of-the-art technology.

OUTCOME OF THIS PLAN WILL BE:

- Technology Upgradation Fund: TUF will facilitate local industries to replace their outdated machinery with the latest/modern technology.
- Technology Upgradation Centres: TUC to give a demonstration effect for introducing latest machinery so that production capability can be brought at par with international standards. A total of 50 TUCs may be established.
- Skill Development Centres: SDCs to produce knowledge based HR required for the upgraded technologies. A total of 33 SDCs may be established.
- JVs: Main inspiration behind JVs includes the access to technology (transferred product and process technologies), organizational and managerial skills for the local partner, public or private company. A total of 45 JVs may be developed.
- Technology Incubation Centres: TICs to facilitate the effort of technology-based entrepreneurs towards the development of business ideas into commercially viable enterprises.
- ITPO Offices: Regional ITPO offices will be established to replicate successful technology models of developed & developing countries.

SUCCESS STORIES

MR. SHERAZ 3D SCANNING SERVICES NIDA LAHORE

Mr. Sheraz, proprietor of the Firm Thermosole Industries Pvt Ltd, is in the business of injection and blow molding. He utilized NIDA Lahore 3D Scanning Services for the part having name "Expansion cover". This service at NIDA Lahore has substantially reduced the cost of services for him By utilizing NIDA Lahore Latest 3D Scanning Services regarding its designing, Mr. Sheraz saved huge time and cost, which would have incurred if this part be developed from abroad. He was very optimistic that he will use the facility in future that would save him much cost. He will also refer other clients that they should utilize TUSDEC facility at NIDA Lahore to save valuable resources.



ADEEL ABBASI CERTIFICATE IN ELECTRICAL AND ELECTRONICS TECHNOLOGY

Adeel Abbasi came from South Punjab to Skilltech International Karachi, an institute of TUSDEC, to enhance his Skills in the field of electronics. He was a very good student and had courage of learning new things. He was enrolled in our 6 months program of City & Guilds UK, Certificate in Electrical and Electronics Technology. After passing his international vocational qualification from the Skilltech International, an institute of TUSDEC, he successfully applied for a job to become a earning hand for his family. He got selected in Frontier Works Organization as a Computer Operator and satisfied to improve skill set on latest standards.



STORY FROM LAKKI MARWAT TUSDEC EU-TVET SUPPORT PROGRAM TVET TRAINING

Zaheer Ud Din, a young guy from Lakki Marwat was ambitious and wanted to get higher education but after his father demise, he was unable to fulfill dreams. He was a laborer and dropped out from his school after passing his eighth class examination. After leaving his education he started apprenticeship in a local welding shop with a skilled person. In the mean time he got to know about the free technical course offered by TUSDEC EU/TVET Programme in Niazi Polytechnic Institute, Lakki Marwat. He applied for admission and fortunately got one in the welding trade. So he learned the welding related skills in systematic way as there was theory and practical classes. After completion of training, he got interest free micro finance from AKHUWAT- MFI. Furthermore, with 40,000 startup capital he started his small level business and currently supporting his family through earning handsome amount.



TUSDEC GALLERY



NA Standing Committee Visited TUSDEC



Inaugural Ceremony of HESC



Annual Iftar Dinner



TUSDEC Head Office



TUSDEC Exhibition in Peshawar



Federal Secretary, MOIP visit to TUSDEC



Birthday Celebrations



Birthday Celebrations



Sports Festival



NIDA Training Participants



TUSDEC Team

Registration
Open

NIDA Lahore

Course Title	Start Date	Timings	Days	Duration	Fee (PKR)
Design & Analysis of Composite Materials	10 Aug 17	10AM-5PM	Thu – Sat	03 Days	30,000/-
Controls Automation using PLCs	15 Aug 17	10AM-5PM	Mon – Thu	04 Days	20,000/-
2D Drafting & 3D Modeling using AutoCAD	15 Aug 17	2PM-5PM	Tue – Fri	02 Weeks	8,000/-
Operation & Maintenance of Industrial Generators	15 Aug 17	10AM-5PM	Tue – Fri	04 Days	25,000/-
Effective Communication Skills	16 Aug 17	10AM-4PM	Wednesday	01 Day	8,000/-
Forklift Safety	16 Aug 17	10AM-5PM	Wednesday	01 Day	15,000/-
Fundamentals of Health, Safety & Environment(HSE)	17 Aug 17	10AM-5PM	Thursday	01 Day	7,500/-
Non Destructive Testing (NDT) – Level I (UT or MT)	19 Aug 17	10AM-5PM	Sat & Sun	02 Days	20,000/-
Metal Corrosion & Its Prevention	19 Aug 17	10AM-5PM	Sat & Sun	02 Days	15,000/-
Project Planning, Scheduling and Progress Monitoring	21 Aug 17	10AM-4PM	Mon – Thu	04 Days	15,000/-
Jigs & Fixture Design for Manufacturing	21 Aug 17	10AM-1PM	Mon – Thu	04 Days	12,000/-
Lean Manufacturing System	22 Aug 17	10AM-5PM	Tue – Thu	03 Days	15,000/-
Pressure Vessel Design	25 Aug 17	10AM-5PM	Fri – Sun	03 Days	20,000/-
Civil Structure Design	26 Aug 17	10AM-5PM	Sat – Mon	03 Days	15,000/-
AutoCAD (Electrical)	28 Aug 17	10AM-5PM	Mon – Fri	05 Days	18,000/-
Fundamentals of Oilfield & Drilling Operations	29 Aug 17	10AM-5PM	Tue – Thu	03 Days	25,000/-

NIDA Karachi

Course Title	Start Date	Duration	Days / Timings	Fee (PKR)
Computerized Embroidry Designing	15-Aug-17	(4 Months)	9.00pm to 2.00pm Monday to Friday	24,000/-
Graphic Design and Merchandiesing	15-Aug-17	(4 Months)	9.00pm to 2.00pm Monday to Friday	24,000/-
Computerized Accounting	15-Aug-17	(4 Months)	9.00pm to 2.00pm Monday to Friday	24,000/-
Fashion Designing	15-Aug-17	(4 Months)	9.00pm to 2.00pm Monday to Friday	24,000/-
Digital Apparal Lawn Prints Designing	1-Aug-17	48 Hrs (8 Weeks)	2.00 pm to 5.00 pm (Tue, Thu, Sat)	15,000/-
Embroidry Digitizing	8-Aug-17	48 Hrs (8 Weeks)	2.00 pm to 5.00 pm (Tue, Thu, Sat)	30,000/-
Primaveera	12-Aug-17	24 Hours	10:00 am to 3:00 pm (Sundays)	16,000/-
Modeling and Analysis of Piping Systems	21-Aug-17	30 Hrs (1 Week)	9:30 am to 5:30 pm (Mon to Fri)	16,000/-
2D/3D CAD	9-Sep-17	30 Hrs (1 Month)	2.00 pm to 5.00 pm (Tue, Thu, Sat)	4,500
Project Planning, Scheduling and Tracking	10-Sep-17	30 Hrs (5 Weeks)	10:00 am to 3:00 pm (Sundays)	10,000
CAD for Product Development	17-Sep-17	40 Hrs (8 Weeks)	10:00 am to 3:00 pm (Sundays)	8,000
Digital Apparal Lawn Prints Designing	26-Sep-17	48 Hrs (8 Weeks)	2.00 pm to 5.00 pm (Tue, Thu, Sat)	15,000
Mechandiesing (Workshop)	18-Sep-17	8 Hrs (2 Months)	2.00 pm to 5.00 pm (Monday, Thu)	1,000
Prints Designing	26-Sep-17	48 Hrs (8 Weeks)	2.00 pm to 5.00 pm (Tue, Thu, Sat)	15,000
Merchandiesing Management Techniquecs	15-Sep-17	(6 Months)	2.00pm to 6.00pm Monday to Friday	24,000
Computerized Accounting	15-Sep-17	(6 Months)	2.00pm to 6.00pm Monday to Friday	24,000
Fashion Desinging & Dress Making	15-Sep-17	(6 Months)	2.00pm to 6.00pm Monday to Friday	24,000
Textile Designing II	15-Sep-17	(6 Months)	2.00pm to 6.00pm Monday to Friday	24,000

NIDA Sialkot

Course Title	Start Date	Timing	Duration	Days	Fee (PKR)
Export Documentation & Business Communication Skills	10-Aug-17	12:30PM-01:30PM	20 days	Mon-Fri	6000
Certificate in Quantity Surveyor	21-Aug-17	09:30AM-11:30AM	20 Days	Mon-Fri	5,100
Inspection Techniques (Workshop Training)	22-Aug-17	03:00PM-05:00PM	03 Days	Mon-Fri	1,500
CAD/CAM for CNC	25-Aug-17	03:00PM-05:00PM	03 Days	Mon-Fri	1,500
2D Drafting & 3D Drafting using AutoCAD	31-Aug-17	03:00PM-05:00PM	20 Days	Mon-Fri	7,000
Office Management Program	04-Sep-17	11:00AM-01:00PM	20 Days	Mon-Fri	4,900
3D Modeling & Rendering	11-Sep-17	02:00PM-04:00PM	25 Days	Mon-Fri	12,500
Computer Assembling & Basic Networking	13-Sep-17	02:30PM-04:30PM	16 Days	Mon-Fri	4,900
Civil Drafting & Quantity Surveyor	19-Sep-17	03:00PM-05:00PM	60 Days	Mon-Fri	15,000
Management of Computerized Accounting	25-Sep-17	09:30AM-11:30AM	25 Days	Mon-Fri	6,500
Export Documentation & Business Communication Skills	28-Sep-17	12:00PM-01:30PM	20 days	Mon-Fri	6,000

NIDA Quetta

Course Title	Start Date	Timing	Duration	Fee (PKR)
Eagle Point (Civil)	10 Aug 17	10:00AM-11:30AM	06 Weeks	10,000/-
SAFE	10 Aug 17	12:00PM-01:00PM	04 Weeks	8,000/-
Civil AutoCAD 3D	10 Aug 17	01:30PM-02:30PM	06 Weeks	10,000/-
Office Automation	15 Sep 17	10:00AM-11:30AM	12 Weeks	12,500/-
3D Max	12 Sep 17	12:00PM-01:00PM	04 Weeks	8,000/-
Basic CAD	12 Sep 17	01:30PM-02:30PM	04 Weeks	8,000/-
Adobe Photoshop	12 Sep 17	03:00PM-04:00PM	04 Weeks	8,000/-
SAP-2000	12 Sep 17	10:00AM-11:30AM	06 Weeks	12,000/-
AutoCAD (Civil)	12 Sep 17	03:00PM-04:00PM	04 Weeks	8,000/-

National Institute of Design and Analysis

NIDA Lahore

Stat Cement Corporation building, Kot Lakhpat Lahore
Phone: +92 42-111-000-143, 0423-514-5791
Email: nida.lhrcourses@tusdec.org.pk

NIDA Karachi

Overseas Pakistani Foundation Building Ground Floor,
2/A-20, Block 6, PECHS, Main Shahrah-e- Faisal, Karachi
Phone: +92 021-34372240, 021-34372242
Email: nida.khrcourses@tusdec.org.pk

NIDA Peshawar

1st Floor ,Khyber Pakhtunkhwa Chamber of Commerce &
Industry GT Road, Peshawar, Pakistan
Phone: +92 91-2563932-33
Email: nida.pescourses@tusdec.org.pk

NIDA Sialkot

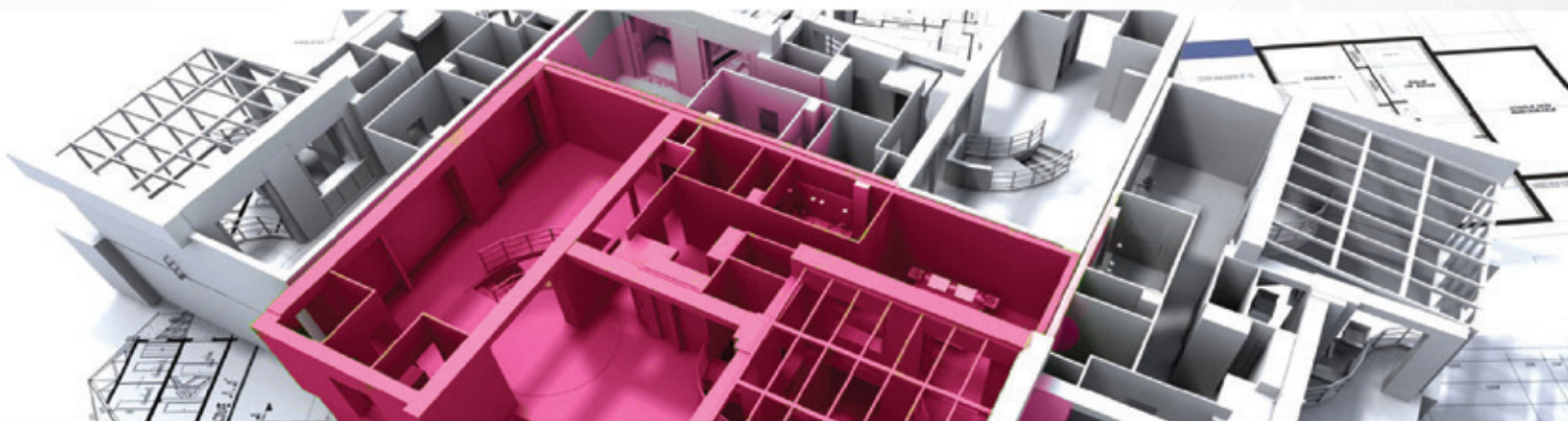
Opposite Mehar CNG Hakim Khadim Ali Road Sialkot
Phone: +92 52 3577321-22
Email: nida.sktcourses@tusdec.org.pk

NIDA Quetta

Owais Ahmed Ghani, Research Centre, BUIITEMS, Takatu
Campus Airport Road, Quetta
Phone: 081-288-0815, 202-6131
Email: nida.qtacourses@tusdec.org.pk

Skilltech International – Karachi

State Cement Guest House Building, Main Stadium road,
Karachi
Phone: +92 021-34821917-19, +92 34299547-48
Email: danish.attiq@tusdec.org.pk



JAHANZEB BURKI Phone: **042 3514 5791-5** | Cell: **0344 444 0677**
E-mail: **jahanzeb.burki@tusdec.org.pk**

National Institute of Design and Analysis

Ministry of Industries & Production

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Editorial Crew: **Yasir Ghani** (Manager BD&M)
Designed by: **Imran Ali Shan**

FIND US HEAD OFFICE

Technology Upgradation and Skill Development Company
Ministry of Industries and Production, Government of Pakistan
State Cement Corporation Building, Kot Lakhpat, Lahore 54770
Tel: (+92)-42-111-000-143 Fax: (+92)-42-35121658
E-mail: info@tusdec.org.pk Website: www.tusdec.org.pk