Executive Development Institute

Course Report

12 th Executive Program

"Political Economy of Power Sector: Policies and Governance"

April 11 - 15, 2016

National School of Public Policy

EDI/Report/02/April/2016

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"POLITICAL ECONOMY OF POWER SECTOR: POLICIES AND GOVERNANCE"

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RECTOR'S MESSAGE

Welcome to the Executive Development Institute which is an integral unit of the National School of Public Policy. The school is a premier institution for the study of public policy, management and related research and analysis in Pakistan with an aim to improve the quality of pre and in-service training and education of all those engaged in public service.

With its headquarters in Lahore, campuses of NSPP are located in Karachi, Peshawar, Quetta, Lahore and Islamabad, providing a four-tier training and education to BS-17 to BS-20 civil servants from tactical to strategic level. The Executive Development Institute, however, offers short courses to BS-21 and corporate Executives working in the private sector.

Building on rich history of providing training in Pakistan, NSPP, since its inception in 2002, has made strategic investment to improve the quality and value of the training courses, through curricula changes, co-curricular events, participants' extensive interactive involvement and a focus on excellence across every aspect of its programs.

Guided by the Board of Governors headed by the President of Pakistan, the school envisages to set up courses for MSc, M.Phil and Ph.D in Public Policy and Management Sciences and to develop a Centre of Excellence for Research where the areas of training, research and consultancy will be combined and would complement each other.

We are determined to ensure the highest standards and quality of all training, education, and research programs that the School will provide. We aim to place emphasis on performance in the public management as we believe public service must create and deliver public value and win public trust.

Executive Development Institute (EDI) of the NSPP is engaged in capacity building and training of public leaders and senior executives of the private and public sector to help meet challenging public policy issues of the country.

Executive Development Program at EDI envision encompassing major areas of Public Policy. It seeks to meet the learning needs of senior leaders of public and private sector engaged in legislature, law, business, executive, industry, journalism and academia, through dynamic lectures from high quality speakers and the faculty, case studies, and small group interactions, to enhance their contribution to the national debate and real understanding of the current issues. It has been the experience of Executive Development Institute that the best learning environment for executives emerges when participants come together from diverse venues but with broadly comparable positions. Participants are urged to share their insights and to test them against the experience and views of their peers. This practice helps to transform participants into reflective practitioners who recognize their own strengths and limitations and are more aware of the perspectives of others.

Programs at Executive Development Institute aim at enhancing understanding of the senior executives of the public and private sector in the realm of policy making and its implementation. It is to optimize their effectiveness as leaders, and to prepare them for their future responsibilities and new management roles. The Executive Leadership Programs sensitize them to manage changes at the policy level in the renewed organizational restructuring.

Moreover, the problems identified and targets set by the National Power Policy (NPP) gives a starting point of discussion for the course. It is assumed that decision makers would be advised to be more proactive in addressing the problem of power. Due to poor maintenance, public sector plants lost nearly one-third of their capacity and nearly 17 percent of their thermal efficiency due to plant degradation. Lack of sustainability is one of the major problems of Pakistan's power sector which is neither profitable to transmission and distribution companies nor affordable to consumers. Some solutions to mitigate the problems may be to strategies power conservation and adopt efficiency measures, consider alternative means of power resources, increase power sector finance, effective management checks and

balances in transmission and distribution and consumers to produce their own electricity and give access to government.

This five day workshop would provide a means of guidance to indicate key activities and not shortcomings which would benefit us from the learned experiences of private sector.

I welcome you once again to the Executive Development Institute so that we can share experiences, generate discussion and open a debate which could lead to a comprehensive understanding of the present and future requirements and bring about a systemic change in the public sector for power generation.

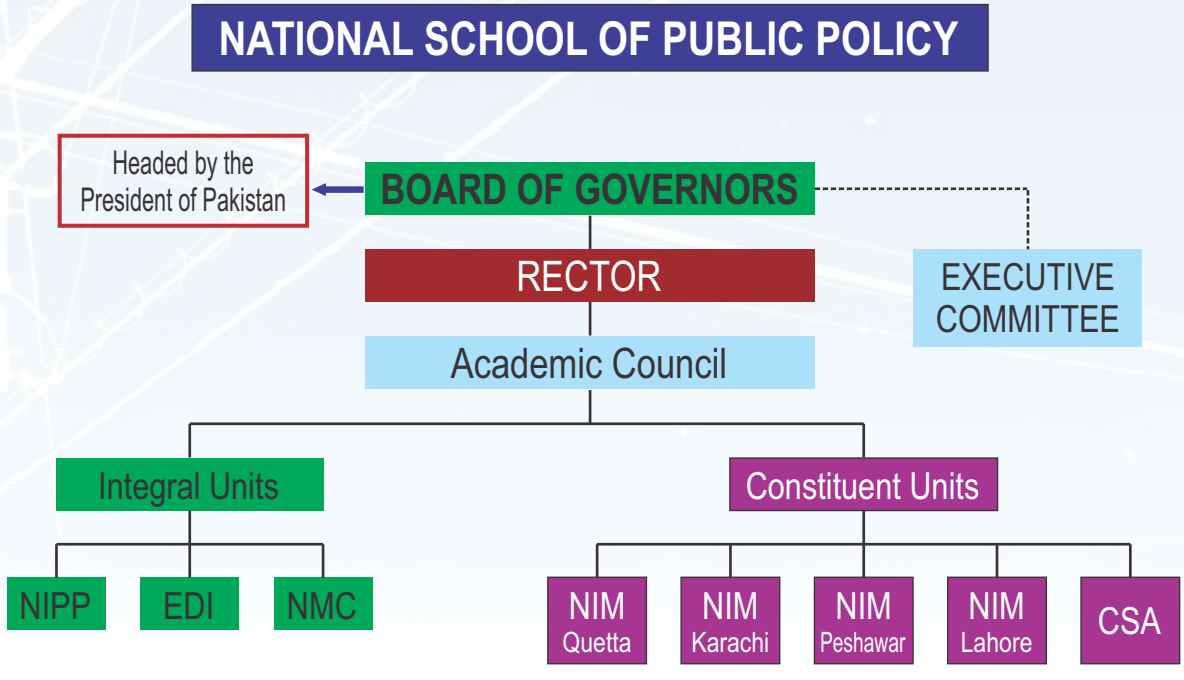
INTRODUCTION

NATIONAL SCHOOL OF PUBLIC POLICY

By

Director General Administration

National School of Public Policy is a prestigious institution for training of civil servants in Pakistan. It aims at building their capacity for undertaking tasks of policy formulation and implementation at tactical, operational and strategic levels. This is achieved in an environment of intellectual freedom so as to generate in them an investigative urge, spirit of



rational enquiry and a genuine desire to seek knowledge. The overarching aim of the NSPP is to improve the quality and effectiveness of public Policies and management in Pakistan, by improving the quality of pre-service and in service training and education of all those engaged in Public service:

The constituent units of NSPP include National Institute of Management (NIM) in Lahore, Peshawar, Quetta and Karachi, Civil Services Academy (CSA) and School of Local

Governance. And the integral units are National Institute of Public Policy (NIPP) and Executive Development Institute (EDI).

Foreign Collaboration

NSPP is working with foreign collaborations with Harvard Kennedy School, Evidence for Policy Design (EPoD), Building Capacity to Use Research Evidence (BCURE), and EcoleNationale D' Administration (ENA), Paris.

Future Vision

- Establishment of I.T Centre
- Online Training
- Research, Consultancy and Advisory Roles
- Technology for Governance
- Data Hub – Participants and Researchers
- Public Sector Think Tank

COURSE INTRODUCTION

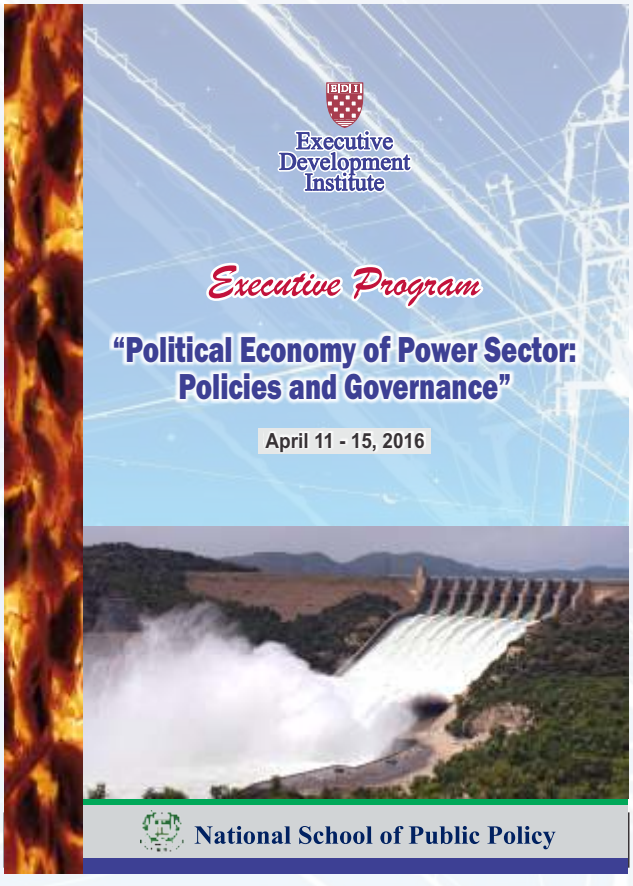
By
The Dean EDI

On behalf of the Executive Development Institute, I am pleased to welcome you all to this five days course which will offer interaction between top managers and executives from government and corporate sector to exchange opinions and strategies to deal with the energy crisis. In modern administration and new management practices the continuous training and cross departmental analysis of problems and achievements is indispensable throughout one's career.

The Executive Development Institute is an integral unit of the school and offers short courses addressing critical issues of National importance. This is the 12th course being organized and more than 200 participants have benefitted from such courses. The Institute is offering this course to analyze the problems of power sector, identify specific causes and suggest mitigation strategies. There are certain known issues such as electricity theft and high cost of energy. The moot point is why the government has failed to rectify these problems? However, the performance of private sector in this regard is also nominal.

The dynamics of power sector in Pakistan have become complex. They have gained importance because of its varied dimensions. One of the key aspects is the shortage of power for industrial and domestic use along with its viability to sustain and remain affordable for the consumers. There is no one particular reason that why Pakistan has reached a stage where power sector poses a serious challenge and poses serious doubts about the working of political economy of the country. Can it be explained as a political issue alone? The economic and governance aspect of this reality is equally important as it impinges directly on the productivity of the country be it industry, agriculture, commerce or other sectors. Alongwith this renewable energy, Pakistan has the potential to offer broader future choices.

Policy Issues and Targets:



- The National Power Policy (NPP), identified four major problems in the power sector: A yawning supply-demand gap of about 5000MW leading to load-shedding of average 14 hour across the country.
- High expensive generation of electricity due to an increased dependence on expensive thermal fuel sources (44% of total generation).
- An inefficient power transmission and distribution system that currently records losses of about 24% due to poor infrastructure, mismanagement, and theft of electricity.
- Inefficiencies, theft, and high cost of generation are resulting in debilitating levels of subsidies and circular debt.

NPP Set the Following Targets:

- Decreases supply demand gap to 0 by 2017
- Decreases cost of generation from 12c / unit to 10/c unit by 2017
- Decreases transmission and distribution losses from 24% to 16% by 2017
- Increases Revenue collection from 85% to 95% by 2017
- Improve governance by reducing the decision making and processing time at the Ministry, related departments and regulators.

The Pakistan 2025: one nation one vision intends to double the power generation to over 45000 MW by 2025 and increase the access of electricity to 90% of the population from the present 67%. Similarly the intention is to reduce cost by 25% and distribution losses to 10%.

Despite the setting of targets and improvement in overall national economy which provided fiscal space for new initiatives the success in reducing load shedding and decreasing transmissions and distribution losses has been limited. Overall transmission and distribution losses remain high though technical losses were reduced from 18% to 17% in 2013-14. The result is that despite significant increases in power tariff the system does not cover costs and problems of arrears leading to circular debt which remains there. The larger drop in the oil prices has not brought any relief in cost effectiveness of power generation. The corruption and mismanagement seriously compounded both the generation and distribution of electricity.

All these initiatives demand an urgent framework to balance demand and supply and appropriate phasing out of ongoing projects. Otherwise, huge reliance on imported power and large foreign funding will place a heavy burden on balance of payments, and will affect the foreign exchange reserve.

Experts and Engineers argue that hydropower is the cheapest way to solve the country's power crisis. Pakistan has failed to tap its vast hydropower potential because policy makers view power policy in terms of short term political tenure and put "personal interest over national interest".

A more prevalent view is that the decision-makers have to be proactive in addressing the problem of power sector.

i. Lack of sustainability is one of the major problems of Pakistan's power sector, which is now no more profitable for the transmission companies (Trancos) and Distribution Companies (Discos) as well as not affordable for the consumer. Technical losses occur when more power is supplied from a limited capacity system.

ii. Some of the remedies are an effective management, system of checks and balance in the transmissions and the distribution, starting of new projects and public awareness is the need of the hour to tackle this crisis.

1. OBJECTIVES:

1. What are the main causes and contributing factors of Pakistan's power crisis? Is it a policy fault-line or governance issue?
2. Should government as a remedy give first priority to power generation projects, efficiency and conservation in power sector?
3. What measures are suitable for our peculiar needs to overcome power crisis and how to generate power through different means within minimum cost to avoid capacity shortfalls and maintain sustainability?
4. How to encourage and ensure exploitation of indigenous resources, which include renewable power resources, human resources, participation of local engineering and manufacturing capabilities?

2. METHODOLOGY:

Four components:

i. Presentation by the resource persons to be followed by discussion and comments.

ii. Case study presentation with the intention to highlight the key issue which is cross sectoral.

iii. Syndicate style group discussion and presentation by the participants.

iv. Opportunity for the participants to make presentations individually and as a group.

3. EVALUATION:

Course evaluation would be done by the participants at the end of the course.

COURSE SESSION - 1

Topic:	Options and Opportunities
Resource Person:	Syed Tanzeem Hussain Naqvi
Date:	11 April, 2016
Day-Session:	1-1

Format and Methodology

The session started while discussing the prospects of generating more electricity on low cost to control circular debt and for generating revenue.

Objectives

- Exploring prospects to generate more electricity
- Finding options to optimize energy generation cost to control circular debt

Where does the problem lie?

The energy crisis based on five factors

1) Supply / Demand short fall of 5000 MW, 12 – 16 hours / day Load shedding
2) High Generation Cost of Rs14 / unit from IPP, 60% of Demand
3) Transmission Lines / Distribution System Breakdown
4) Increasing Circular Debt
5) Drop of Revenue Collection (75 – 80%)

Problem Area

Government of Pakistan does not realize the potential of generating 50,000-60,000 MW. The problem is due to load shedding and gap in power generation to meet demand. Potential should be explored from dams such as Kalabagh (not yet constructed), Warsak which could have Hydel capacity of 4200 MW. Similarly, coal power stations in thar-coal area have a potential of 140 billion ton of coal which is equivalent to 100,000 MW.However, not a single power plant has been installed yet because of the inefficiency of the government. On the

other hand, India has made 132 power station of coal with the capacity of 177,000 MW whereas we do not have a single coal plant.

High generation cost is another big problem. An agreement of thermal power station was signed with America in Karachi for a capacity of 5000 MW and in Lahore for 5000 MW plants. Installation of thermal power station on imported furnace oil was infeasible for hydel or coal options. Therefore, 10,000 MW projects were initiated by chairman WAPDA and 5000 MW plants were in Karachi Electric Supply Company (KESC). The total capacity of KESC was 1000 MW. We used to have almost 40-50% from hydel source and 30-40 % from thermal power stations and the rest from IPPs so WAPDA was running in profit. Now, there is increased dependency on IPPs. Nearly 60% of the power is drawn from IPPs on imported oil making the cost Rs.40/unit. Government increased the tariff to overcome this circular debt which led to the shortage of power because of high dependence on IPPs.

It is a tremendous fault of WAPDA within the last 10 years as we have not improved the power lines. The lines bring electricity to the cities and when the transmission lines were overloaded the power could not be transmitted; even if capacity is available. WAPDA has to pay extra money for power to IPPs from thermal power stations. WAPDA is not running in profit because of not fulfilling the requirement of IPPs. The Circular debt is Rs.350 billion and that not only creates loss of revenue but also results in increased burden on consumers due to the increase in tariff from the government.

Problem Solving Approach

The solution is to generate electricity on cheapest cost either from coal or hydel source. The

hydel station of 10,000 MW can be built or coal can generate 10, 000 or 5000 MW then the generation cost would be of Rs.4 to Rs.5. This would not increase the tariff and WAPDA would be a profitable organization.

The coal plants could not have been installed due to political reason even after WAPDA made many attempts but it could not have been possible. Pakistan's government has not started even a single coal plant of 100000 generation capacity and whereas, India has installed 132 plants from coal and have sold 1050000 MW from coal sources. This creates problem of circular debt which cannot be resolved if the government keeps increasing tariffs instead of installing plants to generate more electricity. Drop in revenue collection is also a big problem which is hard to get resolved as the WAPDA lacks technical expertise.

Short Term Solution

- Shahdra Power House
- Rawalpindi Power House
- Faisalabad Power House
- PiranGhaib Multan Power House
- Jamshore (Sind) Power House
- Guddu (Sind) Power House

Mid Term Solution

- Coal based Power Houses at Tharparkar Sind.

Old Power Generation Rs. 5 - 6 per unit.	Present Power Generation Rs. 13 - 14 per unit.
• Hydel 50 - 60% • WAPDA own Thermal 25 - 30% • IPP 10 - 15%	• Hydel 25 - 30% • WAPDA own Thermal 10% • IPP 65%

WAPDA should work on the power houses and the capacity of these power houses are 8000 to 10000 MW. Now, most of the power stations have been closed except PiranGhaib with 30% capacity and Jamshore with 20% capacity. Out of the capacity of 8000_10000 MW, the generation is 1200 MW only. Therefore, the reliance is more on IPPs and purchasing power at the cost of Rs.14. If the generation get installed at Shadra Power House that would not require high transmission

lines. All the power stations were built to provide supply to their respective cities. Unfortunately, this could not have been materialized due to the inefficiency of government. WAPDA used to draw 40% from our own resources 50% from the hydel source and then to 15 % from IPPs. The generation cost was Rs.4-5 and the selling cost was Rs.6-7 and WAPDA was running into profit.

When the WAPDA was a profitable department generation cost was 5_6 per unit which is now Rs 13 – 14 per unit with high dependence on IPPs Economic dispatched order should be employed which calculates the lowest cost. As the HUBCO's 85 crore payment was stopped by economic dispatch model to control corruption and high cost of electricity. The same models should be implemented to control electricity price and make it accessible on low rate.

Long Term Solution

- Kalabagh Dam
- Basha Dam
- Dasu Dam
- Bunji Dam
- Munda Dam
- All other Dams

Advantages:

- Low General Cost Rs. 1.5 per unit
- Water Storage
- Less Flood Devastation
- Increase Agriculture

Do we need consensus on our survival?

All the dams should be started to generate electricity which has long been the victim of negligence either due to political influence or other administrative flaws. The issues of financing and political confrontation should be resolved to resume all these projects.

Recommendations

- Upgrade WAPDA existing plants
- Allow WAPDA to add own new thermal plants.
- Install Coal Power Plants
- Immediately Start Kalabagh Dam
- Autonomous / Independent WAPDA
- Technical Heads of WAPDA, NTDC, LESCO, etc
- No Political Appointments
- Fix Targets to Control Theft and Revenue Collection
- Revive Old WAPDA Control System through Member Power

COURSE SESSION - 2

Topic:	Conservation and Renewable Energy
Resource Person:	Dr. Gulfaraz Ahmed
Date:	12 April, 2016
Day-Session:	2-1

Format and Methodology

The session started accrediting the role of Executive Development Institute which is functionally so much involved for arranging courses and fostering integration in public and private sector.

Objective

- Exploring the resources of renewable energy
- Finding the energy conservation strategies

Historical Perspective

The potential of renewable energy is examined globally and in Pakistani context. The consumption of modern commercial energy started in the middle of 1970, before that it was just biogas, from the decade of 90th century it followed the linear role. During the decade from the 90th century to the middle of 21 century modern energy followed a linear growth mathematically i.e. progressively increasing but linear. 1n 1950 it followed exponential growth. The end of wars naturally shifted all the emphasis in development and the main factor was exploring energy. Energy consumption raised from 0.7 to 7.1, in order of magnitude a ten times raise which indicates that signs of life are directly proportional to energy consumption.

Energy Consumption and Wealth Generation are Co-Related

Energy consumption co-relates to economic generation, there is a direct correlation between energy consumption and wealth generation with the economic growth. This is also a precedence that energy consumption pre-see the wealth generation, it educate the cost when

this is produced. But what you do not know in hundred and ninety years data, the energy consumption growth curve and economic growth curve corresponds each other. They reinforce energy consumption. Considering the case of Pakistan, 50 years data reveals that economic growth curve and the energygrowth curve intersecteach other throughout the period.In developing country like Pakistan, the energy consumption and wealth generation have direct correlation which indicates that weconsume more energy than we generate.

If the whole world is examined by the high energy consumption countries and the low energy consumption countries, the division between energy consumption per capita divide and GDP per capita divide reveals that GDP per capita divide is the same as the energy consumption per capita divide. If you see themost affluent countries in the world with the high GDP growth are in the same line of high energy consumption per capita. So the reality of the world is people are more significant in terms of the economic power, military power and diplomatic power that they are leading towards development through energy consumption.

Reality Check

If that is a reality then we want a reality check where we stand in Pakistan? We stand at the 1/5th of the whole world so how would you truly look towards overcoming this endemic power if you stand at the 1/5th of the energy per capita consumption. How the country would be developed when energy is an important factor of development.

Knowledge Generation also Co-Relates with Energy Generation

Technology is accelerating the pace of change. Today, the past is immaterial, the present absolute and the future arrives faster than today. The open-minded approach is required to integrate new knowledge and technology for bringing the change.

The problem is, the minds are not totally open they become irrelevant for looking towards future and this is the message to stay open and consider possible what could not have been adjusted in the past.

From IAD upto the present time, the body of knowledge has developed at greater pace and if you try to develop index from that time the knowledge has been doubled in 1500 years. It took fifteen hundred years to double the knowledge from pre-history to antiquity till today,

then it re-doubled in next 250 years in 1750, then it re-doubled in another 150 years in 1900 than doubled in next fifty years in 1950.

The question is, why 1950? The analogy is; energy also took off exponentially in 1950, and so did knowledge. Therefore, not only wealth generation co-relates with energy consumption, knowledge generation also co-relates with energy consumption. The importance is to give value to knowledge. In Pakistan most of the time is spent on survival, there is no time left to innovate things and incorporate new knowledge.

The Case Study of China

Energy consumption correlates with wealth generation: China's energy consumption followed a linear/ progressive growth, in 2002 it changes to exponential growth in 2010 China overtook USA as the largest energy consumption economy. In 2012 China overtook japan as the second largest economy. In 2014, China, overtook USA as the largest trading country. In 2015 China became the third largest arm exporting country. Will China overtake US as the largest economy and when? China will only survive if china will develop institutes for developing knowledge.

Historical Perspective of Pakistan's Energy Sector: MP & NR adopted an optimal energy strategy for 10 years in 1998 that would have strategic long term impact on Pakistan's energy security. Essential elements included:

1. Restructuring primary energy mix- reducing the share of imported oil and increasing that of indigenous natural gas.
2. Introducing use of natural gas as CNG in the road transport
3. Phased replacement of leaded gasoline by introduction of the unleaded
4. Phased reduction of sulfur in diesel and FO by introducing low sulfur diesel and LSFO.
5. Expanding commercialization of TharCoal
6. Utilization unexploited hydro potential
7. Expediting import of NG through regional pipelines

Where does the problem lie?

The energy crisis constitutes a variety of factors such as

- A very low energy consumption per capita at the fifth of the world average; we need to target doubling it ten years
- Present energy crisis is that we cannot provide enough energy even at the present very low level of energy consumption per capita
- Pakistan is energy deficit country and imports nearly 37.5% of the energy consumed; because of lower exports, it faces balance of payment crisis and consequential strain on economy. Oil price plunge is a godsend help to our economy.
- Instead of importing optimal mix of oil, natural gas and coal we import only oil and use 40% of it in power generation that renders the power very expensive, causing recurring circular debt. Endemic/power, non-payment of utility bills, excessive system losses and aging infrastructure compound crisis.

Problem Solving Approach

Generation of Electricity through Renewables
SolarNeed to Unleash a Roof Top Solar Power Revolution in Pakistan

Solar power will become competitive with thermal options as a grid power with another reduction of 20-25 % cost

Solar is cost effective when installed at user end on roof/office tops with two-way meters for selling surplus electricity to the utilities through the grid

China emerges as the largest manufacturer and export of wind power equipment in 2015: cost reduction in wind power is on the cards, which will give a boost to wind power. UK study predicts solar and wind power cost to be lower than CCGT by 2020.

Wind

Pakistan lags in development of renewable energy and has just set course to benefit from global trend. Its cumulative wind power capacity is partly 255.9 MW located in Sindh with corridor. Wind farms will set sell electricity to Pakistan's national grid under a 20 years contract. The projects are being sponsored by a number of companies including Fauji Foundation, FaujiFertlizer Bin Qasim Ltd and the Islamic Infrastructure Fund, the Asian Development Bank is coordinating the government and sponsors.

Some Relevant Case Reference – Global Renewable Energy Trend

It would be interesting as well as relevant to review two examples one of the leader in technology development, USA, and other of the leader in adopting and practicing it, India.

Both countries are promoting the development and proliferation of wind and solar power to augment their power capacity and undertake phasing out of the coal and oil based power plants.

Energy Conservation

- Conservation of energy is a huge source of adding to energy use within the same supply. It aims to optimize the use of energy by cutting down wasteful use and improving energy efficiency.
- By a broad estimate it could add about 20% to our electricity and gas consumption within the present supply.
- Energy efficient and weather-friendly buildings code, design and material
- Effective regulations of household and industrial appliance: space and waters very energy inefficient.
- Encouragement of solar water heater
- Time of the meters to reduce peak_ load demand and reduce load shedding
- Case reference of Japan achieving 20% reduction in electricity demand after the appeal by their PM late 2012
- Conservation through civic responsibility of avoiding the wasteful use by controlling waste of energy, conservation by using efficient lighting and appliance, conservation by insulation and by setting temperature control

Recommendations

- The government would have to provide effective/duty relief and exercise strict quality control of imports to unleash the revolution that could augment power capacity in short timeframe. There is a need to initiate the rooftop solar revolution by reducing the cost of solar energy systems through improved;
    1. Permitting permission
    2. Micro Financing
    3. Zoning
    4. Net Metering
    5. Interconnection process for residential and small commercial PV power consumers
    6.
- It would be essential to create a network of teams across the country on province/district/LGs basis for advice on quality equipment, design assistance, networking for economies of scale and micro financing facilitation

COURSE SESSION - 3

Topic:	Power Generation Projects: Governance and Efficiency
Resource Person:	Zafar Mahmood
Date:	12 April, 2016
Day-Session:	2-2

Format and Methodology

The session started with the historical overview of WAPDA and the role of government in policy planning and implementation. The governance flaws and management issues were also the focal points of discussion.

Objective

- Review of power generation projects and policies
- Highlighting the governance and management issues in power generation plants and policies

Historical Perspective

Pakistan Water and Power Development Authority (WAPDA) was established through an Act of Parliament in 1958. It is an autonomous and statutory body under the administrative control of the Federal Government. The Authority consists of a Chairman and three Members (Water, Power and Finance). Wapda was unbundled in the year 2007 whereby the functions of its Power wing were redefined as Hydel Power Generation and Operation & Maintenance (O&M) of power houses. Following unbundling of its power wing, WAPDA's mandate is, now development of water and hydropower resources in an efficient manner.

After the singing of Indus Basin water treaty WAPDA undertook the responsibility to implement the different provisions of the agreement. All the Indus Basin Replacement Projects/Works were completed by WAPDA within the awarded cost and stipulated time.

This achievement was due to the short & efficient process of planning/ approvals, secured funding, and strict monitoring & surveillance.

When the Electricity Generation was started?

In the decade of 70's, in Asia after Japan, Pakistan established its first national grid station and the distribution of electricity was done through single unit to household and industry.

WAPDA carried out development of not only Hydropower Projects but also established Thermal Power Plants on various fuels like Furnace oil, Gas, Coal, HSD etc. Apart from power generation, a vast transmission and distribution network was also established. The best and efficient practices were exercised to operate & maintain WAPDA Power Plants. WAPDA used to generate 40 % from its own resources and 60% were being funded by World Bank as a loan.

The Decline of Power Sector

In 1994 power policy faced many challenges and became quite controversial because the idea was to bring power sector in. The Power Policy was restricted to set up Thermal Power Plants. The expansion was only in private sector irrespective of technology, fuel or location. The outcome of policies for establishing Hydropower Plants in Private Sector was not encouraging; the first private hydro power project has been commissioned after 20 years of 1994 Power Policy.

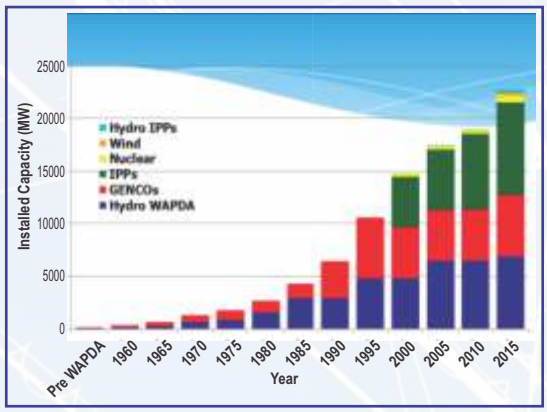
When WAPDA started the feasibility of Kala Bag dam during 1990 with the view of starting generating electricity through hydel till 1995 or 1997 but it could not have been possible because the dam became controversial. Then the attention was shifted to Ghazi

Barotha project considering it a low hanging fruit. The best running project classified by the World Bank completed in 2004 and generates electricity of 1,450 MW.

A Critical Reflection by Graph

The graph reveals that at the time when Pakistan has built the total electricity generation of 50 MW and according to the estimates, today, it requires 50 MW to get the mobile phones charged. The first generation was from Warsak Dam even before establishment of WAPDA. And then the WAPDA added, Mangla Dam, Tarbela Dam, and then Ghazi Brotha Dam. The graph indicates that after Ghazi Brotha Dam there were least addition to the generation of electricity that further decreased after 2005 since then the dependence on hydel observes a declining trend.

PROGRESSIVE INSTALLED GENERATION CAPACITY (MW)



Governance Issues

Corruption in the distribution system was the major governance issue for WAPDA. The institute of meter reading badly affected the credibility of the organization. Theft of electricity, illegal connections, over billing etc. were the tools which hampered growth. Corporatization/Privatization of distribution sector was considered to be an option for improvement.

Military Take-Over: It was the common notion that military can curtail misreporting in meter reading and theft. But unfortunately, it did not happen. Corrective measures like induction of army in WAPDA (1999~2003) were not successful. In addition, military personal did not use technology to catch theft which could have been used by smart metering. The FESCO has revamped the monitoring mechanism for capturing meter reading and uploading that information to the database. This has brought significant improvement.

The fundamental fault line was the act of electricity of 1901, which is now in the process of amendments with stringent penalties. Otherwise, the punishment for tempering meters and theft was same that had been implemented during 1901. At the time WAPDA did not have any enforcement mechanism. Therefore, the question is, if someone commits tempering or theft, then where would be the complaint get registered? And how would it be enforced? Who have enforcement mechanism? The Federal government does not have any enforcement mechanism either in cities or in villages. Police Department had enforcement mechanism

which again is a provincial body and it could not exercise law enforcement in the power sector

India, came up with a solution to hand over such affairs to provincial bodies. The distribution and generation both were handed over to provinces which definitely involves provincial stake, and if the generation and distribution gets effected, it have a direct impact on provincial finances. India minimized the corruption by involving local authorities whereas, in Pakistan WAPDA was under federal government and the enforcement mechanism was under provincial government which had discord in implementation.

No Comprehensive Generation Plan: The demand of electricity had not been considered as an essential elements while preparing energy generation plans. All successive government made their own polices seeking short term solutions to prevailing problems. During PML-N tenure, in 1994, the action had been taken against IPPs which halted the investments.

WAPDA prepared National Power Plan in 1994 but it was not approved by GoP due to the issue of Power Policy, 1994. There was no investment in hydel projects and as KalaBagh could not be build. The shortage of electricity started from that point and then rental power plants aggravated the situation even more. Now, there is a need for Least Cost Generation Plan.

High Cost of Electricity: The inflated electricity tariff for consumers is due to the high cost of generation from energy-mix which contains about 2/3rd of cost from energy generation from imported fuel. The ratio of Thermal and Hydel generation has got distorted as the ideal energy-mix (60% Hydel and 40% Thermal) could not be ensured by timely addition of hydropower.

Difficulties in Arranging Finances for Power Projects: The Governments face serious issues in arranging finance for Mega Hydropower Projects requiring huge initial investment like Diamer Basha Dam, Bunji etc. The International Donors have limitations of funding the Projects located in disputed areas (AJK & Gilgit Baltistan) where most of the future mega hydropower projects sites are located.

Volatile Security Conditions: The Power Development Projects have suffered due to volatile security conditions and law and order situation in the country. The investors and highly renowned Contractors were hesitant to participate in development Projects. The above factors contributed towards delay in the projects, restrictions in bidding process,competition, and higher costs of electricity of generation.

Efficiency Issues

- Thermal Power Plants in public sector have serious issues of capacity and forced outages due to inadequate maintenance and delay in over hauling and up-gradation of units
- High cost of electricity due to furnace oil production
- TRANCOS are also performing well but still transmission losses is a big challenge, which requires higher voltage transmission lines.
- DISCOs performance have not been satisfactory because of the Transmission and Distribution (T&D) Losses and receivable.

Recommendations

- Comprehensive and consistent Policies & Plans
- There should be Co-ordinated efforts at federal & provincial levels
- Innovative solutions for financing arrangements should be designed
- Improvement in monitoring & surveillance of power projects with modern techniques

COURSE SESSION – 4

Topic:	What Measures are Suitable for Power Crisis and How to Generate Electricity through Minimum Cost to Avoid Capacity Shortfalls?
Resource Person:	Sayed Akhtar Ali
Date:	13 April, 2016
Day-Session:	3-1

Format and Methodology

The session started with the overview of finding strategies for generating low cost electricity and discussing the possible advantages and issues with every source of electivity generation mode.

Objective

How to generate electricity through Minimum Cost to avoid Capacity Shortfall

Reviewing the Pros and Cons of Various Sources of Electricity Generation

Moto: Energy Security at Lowest Cost

Energy security is dependent on the following such as:

- Availability
- Affordability
- Inputs: local versus foreign
- Logistics
- Political Economy ;national and international
- Technology
- Macro-Economics; Trade ,debt and Foreign Exchange

Problem Area

Power sector has a lot of relevance to the primary fuel. Only in Pakistan, power sector and fuel sector are compartmentalized; in most of the economies and jurisdiction this section is handled and administered under one unit. This is one of the problem which the country is faced with.

After 18th amendment power sector has been facing a lot of issues. The Sindh government and Federal government have not been able to develop consensus on a lot of issues. Such as, Sindh, has as much rights on LNG as on locally produced gas. Issue of technology is a big issues and then there are issues of macro-economic; debt, trade and foreign exchange. Considering a host of issues, electricity generation at lowest cost is quite complicated issue which does not have a single word answer.

Where Does the Solution Lie?

According to the minister of fuel, Gas is the solution__ but there is no one single solution in reality.

There was a time when hydro was cheap, thermal and hydelisbeneficial. The PML-N government opposed thermal power in the past. And there were hydel lobby with the view that thermal power is against national interest. With the change in time, now the same government, is considering thermal a viable source. The lesson is, there is not a single source of energy that can resolve the problem. The solution lies in a mix sources of energy.

Pros and Cons of various Energy Sources

All the energy sources has strengths and regresses. Hydro used to be consider a cheap source at the cost of Rs1.5 but now the new tariff costs Rs.8 or 9. In 1973, Nuclear power was cheapest source of energy which now costs Rs.13. Things have changed.

Solar

- Abundant and inexhaustible , and everywhere
- No fuel requirements, cost and logistics
- No water consumption except for some cleaning
- No or lesser transmission logistics
- Costs/CAPEX falling down Rs.10 per unit
- Available only when sun shines
- Large land requirements
- No base-load characteristics
- No emissions, clean and environmentally friendly technology

The issue is requirement of land for the installation of plants despite the fact that sun is unlimited but still Cholistan, a far flung area is being utilized. Although, roof tops can be utilized that can be final solution. Instead of utility at least in 5 or 10 years' time 50%

households would have at least 2 panels. Generally, space problem limits the application of solar. Variability and storage issues also createsproblems,it is available at day times but not at night hours when the demand is high. No base load characteristics as compare to other base load plants which constantly unless some mechanical fault occur. Hydro works in large volume thermal also generates 2000 to 4000 MW whereas, solar only generates 100 MW. The advantages are; its emission free, clean and environmentally friendly.

Wind

- Average CAPEX
- Low capacity utilization
- Limited environmental consequences
- Regional availability
- No fuel required
- No water
- Seasonal and diurnal variations
- Average COGE

Wind and Solar holds quite similarities, variability creates problem because theconstant wind is not available all the times therefore, targets cannot be set or achieved. 100 mw money is taken and only given 70 mw. Cost of generation was Rs15 and now the tariff of wind has decreased to Rs10. CAPEX average is 1000 to 1200 dollars per kilo or 1.2 million dollars per mw, the average of power plant is about 1.5 million dollars per mw (plus-minus). Capacity utilization, wind capacity factor is 35% due to variability and solar is 17% so, renewable energy sources have such issues. Hydro faces the same issue in winter because of non-availability of water faces low capacity factor. Considering such factors investment apparently can be misleading on the basis of per mw. Because the capacity utilization of coal is 80% or 90%, and if is it 2000 dollars per mw it is quite high.

Gas and LNG

- Gas reserves going down although high potential
- Prospects for local gas going down due low prices
- Logistics issue
- Relatively Higher Thermal Efficiency
- Least COGE :Low CAPEX
- Low gas price Regime and LNG availability

It was a notion in the past that gas availability in the Pakistan spanned over 100 years. Sui was initiated and now the gas resources has depleted. The energy plan with the assistance of atomic energy commission was established to generate 35 to 40 thousand mw from gas and ultimately 80 thousand mw from gas. But the situation is changing with the time and the gas resources are rehabilitating. LNG is offering opportunity to produce energy with the availability of resources because all the issues of logistics, trade and price have been resolved. This leads to a statement that "gas is the solution".

The gas has issues of terminals, first the ship brings that and get the terminals installed. Once the terminals has been installed then as the Punjab consumes high so the pipes will be spread over in that area to give supply to other provinces. The project of pipelines are being planned. LNG plants efficiency is 60% which has increased the prospects of LNG. Cheaper gas, wider availability and highest ever thermal efficiency for today's technology that has made gas very competitive.

Oil

- High and Low price regime
- Medium CAPEX
- Average Thermal Efficiency
- Some Logistics issues
- Environmental issues
- Low oil prospects in Pakistan

There was a time when all the problems raised from low oil price as recent as Musharaf's regime, oil was cheap, 40 $ a barrel. Then it raised to 50$, and 60 even up to 140 $ dollar at some point. But now the forecast is the oil price will remain low for next 10 years. The CAPEX is 1.3 million $ which is not high. The average thermal efficiency is 40%. It has logistics issues for spreading the pipelines. There was a time, when the National Logistics Cell's (NLC) trucks used for oil, then the PARCO's pipeline was built. Therefore, all the major plants of thermal coal and oil face logistics issues. It also creates environmental issues for using worse kind of highly sulfurous oil due to cheapness.

Nuclear

- No more cheaper
- Environment, waste and safety issues
- High CAPEX (4 Million USD/MW almost twice)
- As expensive or cheap as wind and solar or hydro
- Political limitations; no China no nuclear
- High capacity utilization
- Heavy water and land requirements

Nuclear is no cheaper, there are major environmental issues, safety issue, high CAPEX more than 4 million $. It can only be possible if Chinese provides loan which raises political issues. If china refuses then Nuclear power could not be attained from somewhere else. The negotiations are going on with China to invest through their resources and charged per unit. This could not be installed through given resources of Pakistan because the capital cost is quite high even the oil price is less.

Hydro

- No more cheaper
- Water versus electricity Politics
- High CAPEX
- Available in winters mostly
- Low capacity factor
- Construction complexities
- Displacement of population
- Environmental issues
- However, base load large power prospects

No more cheap, Neelum Jhelum holds tariff of Rs.14 although it is a bad project. Interest cost is something when you calculate revenue cost of present based on next 40 years then that decreases to greater extent. A good way is to make comparison is of unit cost. One way of measuring a viability of projects is its unit cost. Following such criteria such high price cannot be defended but people say KalaBagh can generate electricity forRs.1.5, "it's a myth". The dam is required for water storage instead of generating electricity. Because for water storage either the Pakistan have and the other is Basha after Tarbela. Other hydro power has no storage they all are Runoff Rivers. Resultantly, Hydro has become an old story even it holds quite importance. But, the need is to come out of the extremism that the hydro is the solution when it is not, it is only the one of component of energy-mix. There was a time when World Bank strongly opposed Hydro as it displaced people which is revealed from Tarbella. And now same is happening in Basha. The World Bank advised to give people the money of land and re-settle people. Construction complexity is also involved, Tarbela's capacity is 6000mw in summer and in winter it reduces to 1000mw. Capacity factor Neelum-Jhelum 4-4.5 million USD/mw which is almost equivalent to Nuclear, and the capacity factor of hydro is 40% or 50% whereas, in Nuclear it would be doubled 90%. Both have no fuel cost, nuclear only have a little bit fuel cost.

Coal

- Major Environmental Consequence; Land degradation, pollution as well as climate effects
- Large resource availability(Thar)
- Average CAPEX
- Cheapest after LNG currently
- Large Base Load characteristics

- High capacity factor
- Coal logistics complications
- It creates major environmental consequences,

A Case: Narration of a case with reference to political economy and management flaws. In Sundar, near Rivand, Punjab government proposed to install 150mw coal plant. When the Lahore is naturally expanding, then what will be the consequences if the LNG and coal plants are coming from the same area?The 10 years old planning is being implemented when the dynamics have changed. Simply because, the feasibility study has been conducted and the project have been approved. Instead of negotiating to the government to change the targets as the project is outdated. The whole emphasis is to get that implemented which is major management and capacity failure.

Myth: Pakistan is resourceful country, and can be developed but the bureaucratic elite does not let the things happen, this indicates only a fallacy.The proposition is Pakistan is resources rich country, when it is not, Pakistan is the resource poor country. Water is depleting, land has been squeezed because of high population, per capita land availability is equivalent to Bangladesh, water has become scares, and minerals are not available. People think Pakistan have a lot reservoirs but the leader and bureaucracy does not let anything happen. Consequently, lack of resources creates problems for governance.

Short Term Energy Targets (2017-18)

- Add 10,000 MW of Electricity into the Grid
- 1-2 BCFD of Natural Gas/LNG
- Zero Electricity Load Shedding

A little load shedding would be viable because a high investment on zero load shedding would not bring much benefit. America have 11 million mw installed capacity and, only 70% is being utilized. 30 minutes load shedding from Diels is quite high therefore, 5 to 6 % load shedding is necessary otherwise, if the load shedding ends in 2018, if the same pattern will be followed then it will come again in 2020. The capacity increases on function and demand follows continues fashion.

Pakiswtan Energy Potential and Resources

Resource	`Potential	Known Reserves	Installed/Consumed	Net Availble
Oil (Mil. Barrels)	22,000	936	609	327
Gas (TCS)	282	53	23	30
Hydro	40,000	20,000	6,447	Renewable
Coal (Billion Tons)	200	185	Nil	200
Wind (MW)	110,000	20,000	Nil	Renewable
Solar	Unlimited	20,000	Nil	Renewable
Coasl Base Methane	25-50			

Recommendations

- Options are very limited and individual is so bound by various pressures, we should go for collaborative solutions, technical experts can work with public servants for better results.
- But unfortunately collaboration is difficult. Optimality is needed which is not available all the times because of political issues or some more difficulties, as if world bank or other agency.

CPEC Portfolio Projects

PROJECTS	US$ MILLIONS
Energy	33,793
Transport and Infrastructure	
Roads	6,100
Rail Network	3,690
Gwadar Prt	786
Others	44
Total:	44.413

COURSE SESSION - 5

Topic	Case Study: Service Delivery in Power Sector
Resource Person	Mr. Omer Rasul
Date	13 April, 2016
Day-Session	3-2

Format and Methodology

The session started while drawing the importance on customer satisfaction with sound service delivery system to generate revenue and gaining political stability. Since the new management came in 2014. A lot of work has been done vertically, though, convergence of things are changing. The main issue is customer, when the customer does not receive service delivery then things get difficult. The system does not have any policy framework, and things wrangles between officers __it's a bureaucratic phenomenon.

Objective

- Presenting a case study to revamp service delivery system through technological interventions and change in administrative infrastructure
- Reviewing the importance of sound policies and strategic management models for better service delivery outcomes.

A Case Study
Service Delivery through Administrative Service

In service delivery, the focal point is customer, and if the customer is not satisfied then the concept of service delivery is failed. The bureaucracy is weak; for instance, there is no policy framework available in the system for the provision of services. Consequently, things depend on the officers if they would bring about changes in the system or not. Even some bright officer takes responsibility to change the system through interventions that only lasts till their tenure. The next bureaucrat comes and brings back the centuries back old files because bureaucrats have this uncanny habits of going back to the basics.

What to Do?

A framework is required for the provision of service to the 23 million customers and the basic elements are meters, lines, and transformers. And if the customers pays bill then should receive uninterrupted supply of electricity. If you breakdown these things that includes; meters, meter reading, low voltage, load shedding and any fault. So, the question is, for the provision of all these service what is the service delivery mechanism? When the meters gets installed in two or four months, load shedding span abruptly increased, and the theft and overbilling is everywhere. Where is the inquiry mechanism where a user can get the complaint registered or an officer's performance can be monitored? The gist of the whole debate is there is no criteria available which is available to consumers, secretaries or chief engineers.

When army takes charge, it hands over to army who suspends people and fills the gap of demand and supply. They provide some emergency number and resolve matters with authority. But this is short-terms strategies which ends in one or two years.

Problem Solving Approach

To come with interventions to rectify the system it took two years to management just to think about service delivery tool. What should be the mechanism to provide services to customer, and then how the data should be utilized being gathered while the provision of services. How can you have key performance indicators on the basis of which you can hold on a line of hierarchy? Which follows alignment to the meter reader to the SDO to the excision and SEOs responsible on those service provision parameters of customers and then hold them periodically accountable, to their postings, transfers that should be made in line to that?

Therefore, the proposition could be LESCO can change things in-house to correct the flaws or public-private partnership models can be engaged____ it was just a proposition.

The real idea to change the processes was contractual arrangement outsource to engage some brainy people. First to understand the processes and then to receive technical assistance by technological models with innovative techniques and sophisticated devices.

Following this, first sort of activity which we made is according to the system. IESCO, first time initiated a "ROSHNI" scheme. It is now coming and being unfolded now and the response is good.

Bringing IT in the government is a quite challenging task, it's always easy just to pilot things, but the challenge is scaling-up the projects. The problems arises while scaling up the things through policy and structural changes. Similarly, a pilot is done for initiating Roshni as well, and the consequences will be different when the same project will be scaled up in all the Discos.

IESCO was selected because of showing top performance. In NEPRA regulations on the basis of line losses, recoveries and key performance is on top. It has record of 100% recovery and the line losses are less than 10 digits which range in single digit. The idea was to implement the service delivery model on IESCO first and then to SEPCO, HECO and KESCO where the theft is high.

Case: IESCO – SERVICE DELIVERY ORIENTATION TILL JULY 2015

The situation was there was a little connection with customers residential & commercial

- Little Measurement & Tracking: Of Customer Complaints
- Little Measurement & Tracking: Of IESCO Employee Performance
  - E.G. Meter Shortages
  - Wrong Meter Readings
  - Transformer Shortages
  - Cable Shortages Etc.

❖ FEW IESCO SYSTEMS

- No Customer Database
- No Employee Database
- Limited Internal Communication Channels
- No Performance Tracking Processes & Systems

ROSHNI INSTANT TEXT & WEB BASED COMMUNICATION FOR ALL STAKEHOLDERS OF IESCO

REAL-TIME DATA PROFILING PLATFORM

FOR 2.4 MILLION CONSUMERS, 130 OFFICERS & 832 LINEMEN

CONSUMER SERVICING, INFORMATION & EDUCATION INTERNAL PERFORMANCE MANAGEMENT

LAST 4 MONTHS: COMPLAINT RESOLUTION TIME DECREASED TO 1/3-1/5

Mobile penetration, in Pakistan there are 135 million connection out of the population of 190 million. So the target was mobile penetration is everywhere, everyonebelonging to each calls have a mobile phone. So let's use mobile phone to achieve our ends of service delivery. A company was outsources to prepare a software based on the processes of systems.

NO___ FREE LUNCH

Government wants Free Lunch: because budget is not available, and if someone would be hired from outside that arises political questions and then challenge of planning and finance. "No pains_ No Gains", for achieving a cause hard work and political rivalries will be faced to bring about change in the system.

FEDERAL COMPLAINT CELL

- A Mix of Manual & IT based System
- Online Web based Complaint System
- Consumer Friendly System
- Established within the Given Resources
- Effective Follow up
- Strict Disciplinary Action against Lapses

ESTABLISHMENT

- FCC Launched in June 2015
- Software Prepared by NITB without any Cost
- Existing Official Website was upgraded
- Round the Clock Working 24/7

Reasons of Success

- Ownership at the Highest Level
- Effective Follow up
- Strict Disciplinary Actions in case of Non Compliance
- CEO Discos are held Personally Responsible for Poor performance
- Multitier Verification of Resolved Complaints
- Easy Access

COURSE SESSION - 6

Topic:	Strategize Energy Crisis through Hydro Power Generation
Resource Person:	Mr. MaqsoodShafiq Qureshi
Date:	14 April. 2016
Day-Session:	4-1

Format and Methodology

The session started while discussing the potential of hydropower generation and the possible advantages. Among the renewable energy resources available in Pakistan with abundance is the hydropower potential, which is environment friendly and economical source of energy. As we know that power energy is the most critical issue in the developing countries.

Objective

- Exploring the possible potential of Hydro Power Generation
- Strategizing framework to utilize indigenous resources to deal with the challenges

Backdrop of the Discussion

The acute shortfall of electricity has resulted in load shedding and frequent shutdowns of industry which results loss to the economy and counterproductive to the foreign investment. We have to evolve a strategy by looking into our indigenous energy resource to address issues and finding solutions to the problems related to power crisis. As hydropower potential is available in abundance, it will not only fill the gap between supply and demand but also play a pivotal role in the development of the country.

Historical Overview

The country has a reasonable history of hydro power generation. In 1947, when Pakistan got independence, we had only 60MW available electric power out of which 50MW was through thermal generation and 10 MW was through hydropower generation. With the view for making Pakistan resourceful in energy sector, Government of Pakistan planned different hydropower projects. To take up this gigantic task for resolving the water and power issues, inception of WAPDA took place in 1958, and the journey to produce and distribute electricity was taken to the next level. Government started to build small hydropower plants such as Rasul, Dargai and Malakand hydropower project. The work on the Warsak hydropower project was started in 1957 and the first stage with 160MW started functioning in 1960. The second stage development was started in 1977 and the project which became fully functional in 1981 producing 243MW. The first major Multipurpose HPP, named Tarbela dam was constructed in1976 and further through three extensions up to 1995 the total production was enhanced up to 3478MW. Mangla dam 1st stage of 400MW was also completed in 1967,and its ultimate capacity of 1000MW was achieved in 1994.

After these two multipurpose hydropower projects, constructions of major dams could not be continued due to reservations on Kalabagh Hydropower project which was ready for construction in 1985. As a result the demand and supply gap was widened as short term solution. Reliance on thermal power was increased. The energy mix which was 58% Hydal and 42% Thermal in 1980 which changed to 29% Hydal and 66% Thermal in 2015. Only two medium size run of the river Hydro power plants i.e Ghazi Barotha 1450MW and Chashma 184MW were added from 1995 to 2004.

Underlying Causes of Decline in Power Sector

The history of Pakistan reveals that only two major multipurpose hydro power projects has been constructed since our independence. The demand and supply gap has not been noticed due to non-exploitation of indigenous power resources. Pakistan has huge identified Hydropower potential of 60,000MW but we have not been able to take benefits from it, instead we switched to oil, gas and coal resources as short term solutions. It did not help but further worsen the situation by increasing the power tariffs for the common man as well as the industry to unaffordable limits. Coal generation can only be done at great environment hazard. As far as oil is concerned over 70% of country needs are met through imports. This

consumes about $6.7 billion of our import bills. We have also started importing gas in the form of LNG. In light of above scenario we are only left with hydro power generation which is cheap source of energy in the long run and can produce enough energy not only to overcome our future needs but also make the power energy affordable.

Moreover, the distribution system of power is also inefficient, power which we are producing is not fully utilized by the industry and other consumers, due to the technical losses and pilferage. The reservoirs are depleting due to sedimentation, no major multipurpose project is under implementation at present, we would face water availability constraints in addition to power shortages in future. As the living standard of the people in Pakistan is getting better, the demand of the electricity is increasing day by day. Despite some halfhearted measures, we are not putting effective checks on energy wastage in domestic use as well as in commercial activities. Yet there is a need to plan and formulate the strategy to tap additional energy resources in addition to reduction in losses and put effective checks on pilferage and wastage.

Problem Solving Approach

The construction of large dams has not taken up in the last four decade due to variety of reasons, including the enormous opposition faced from our own people and critiques. As a nation we should be on one page that on every stream there must be maximum number of small, medium and major dams constructed, to harness the available hydropower potential. Hydropower has played a significant role in the economic development of all the developed nations who have opted for optimum hydropower development on all their river systems. The option of thermal generation to meet the immediate energy needs of the country has caused a drastic increase in tariff and intermittent power supply, which resulted in switching of major industrial consumers to captive power generation and consequently causing higher manufacturing costs. This scenario also hampered our exports as compared to china, India and Bangladesh. Thermal support may be allowed as a short term solution to meet the immediate requirements and in the long run to cater as base power load. However it's share

in generation should be kept to minimum as long as possible. Other renewable energy resources like wind and solar power may also be considered but to reasonable limits.

In short, Hydropower is the ultimate choice for filling the increasing demand of electricity. It may be emphasized that the major hydro power development should be carried out in public sector as a long term solution, whereas private sector be also encouraged to participate in small to medium sized projects. Preferably on Boot basis.

WAPDA has started some new projects in public sector i.e. Tarbela -4 =1410MW, Golan Gole = 106MW Neelum Jhelum= 969MW and Keyalkhawr HPP =122MW, which are at their construction stage and there are some projects which are ready to start. For Dasu hydropower Project-5400MW preparatory works have been started and main construction would be initiated early next year, so that Pakistan could develop and we can compete world markets with reduced manufacturing costs.

Recommendations

- Identified HPPs may be given top priority for implementation.
- Encourage private sector participation in (i) Hydro Power Projects (ii) Power System infrastructure such as Power Transmission system, Distribution system etc.
- Power consumption to be reduced through Energy Conservation, reduction of system losses and improvement of plant efficiency.
- Alternative energy resources such as Wind Turbines, Solar Systems and generation through Biogas/ Fossil Fuels need to be tapped.
- As a policy matter GOP/Provincial governments should develop HPPs on priority as compare to other generation sources.
- Hydro Power generation being the cheapest & indigenous source of generation, be adopted in the best interest of the country.
- Hydropower is a clean, environment friendly and renewable source of energy.
- Multi-Purpose HPPs with storage would not only solve the power shortage issue but also provide sufficient water for agriculture needs in the future

COURSE SESSION - 7

Topic	Institutional Decline in Power Sector
Resource Person	Mr. Tahir Basharat Cheema
Date	14 April, 2016
Day-Session	4-2

Format and Methodology

The session started while accrediting the executive development institutes in Pakistan. Time is changing and institutes instill skills to change with the pace of time to combat with forthcoming challenges.

Objective

- Critically analyzing the underlying causes of WAPDA's failure
- Analyzing the potential of new initiatives being undertaken to combat with the power crisis

Backdrop of the Discussion

In order to understand the governance and role of policy in power sector. It is important to understand the original architecture of the Pakistani power sector. In 1947, our total generation capacity was 60 MW and primarily it was through coal and some hydro. No-oil was being used and no other means were available. And now after 60 years we are again thinking about coal. We started with coal India did not lead coal and now it stayed glued to coal and we went for oil. Light Diesel Oil (LDO) is being used which is a dirty form of oil easy to use and it does not soil hands that indicates an unviable solution.

According to the survey, conducted last yeast (2015) 74 MW is being used only to charge cellular phones while in 1947, the generation was only 60 MW. In present, the installed capacity 23000 MW, since independence.

Historical Perspective

In 1947, we had electricity departments in the provinces and then we had private electricity company such as, Peshawar Electric Supply Company moving on to compel power company,

ARCHITECTURE/ORIGINAL

- Low density power system inherited in 1947 - only 60 MW capacity,
- WAPDA set-up under the WAPDA Act of 1958 - total capacity of 119 MW.

Merger of Provincial Electricity Departments (1958-60) and subsequent nationalization and merger of Electricity Companies turn WAPDA in Nation-wide integrated Power Utility (1975 to 1081), except for the 1913 incorporated KESC.

- GoP's inability to follow-up on Tarbela HPP and reliance on Oil - 1978 Hydel-Thermal Ratio 80:20.
- One page Policy Paper of 1987 barring WAPDA to take-up Thermal Generation - restricted to hydel generation alone - no headway.
- WAPDA's access to budgetary outlays restricted and losses started becoming evident.

Rawalpindi Electricity Supply Company. We had comparatively a small power supply company in Faisalabad then Multan Electricity Supply Company. And very small but a dynamic electric supply company in Muzafargarh known as the small-town electric supply syndicate. And there was Karachi Electric Supply Company.

WAPDA set-up under the WAPDA Act of 1958 and was a twin sister of tenancy value authority (TVA) and that was a great success of United States. WAPDA has done much better than TVA. After that ZA Bhutto privatized all national parties. WAPDA worked with significance and every technical person from chief economist to geologist were available at the time. The point is all the privatized companies were merged in WAPDA in 1958 and were nationalized.

Now according to the architecture WAPDA could only survive if, it would follow the original architecture and condones. Was basically to fast track hydel generation. Unfortunately, the WAPDA was unable to follow upon the Tarbella hydro project which was completed between 1976- 1978. And all of sudden everybody started an easy way-out which

was oil generation. If the ration is 70 years to 30, 70 hydel and 30 thermal then it is fines. It is not so, in 1970, a report of WAPDA stated that hydel thermal ratio was just 80:20. With Tabela's advent the hydel generation had ballooned to 80%. And that's the sad fact 80% is hydel generation and 20% is thermal. And the same report reveals that out of 20%, 19% was from gas, the fact is so sad 1% generation is from oil. It is 46% currently, and that 80% of hydel generation is unfortunately down to 29%. See the original architecture and where we are heading. There is something wrong, in somewhere, whether is it a governance or policy failure.

The misconception prevails that 1987, Banazir Bhutto, brings in the IPPs….. it started with the one page policy paper of 1987. It was authorized by Gen. Zia-ul- Haq. As the president, it bared WAPDA to take up thermal generation and restricted it to only hydel generation. And then there was GaziBrotha hydro Power plant 1450 MW plant which is runoff the river. And the Neelum Jhelum 9069 MW again runoff the river is underway. Sadly, it is underway from the last 200 years. But still something is happening. And the fact remains this 1987 one page policy paper, authored by the president of Pakistan, in fact dealt a Federal blow to WAPDA. And afterwards, the next government came in 1994 policy. Now, we will soon be having independent transmission lines from private sector but if it comes though competition. If, it does not come through competition. Then it will be of no-use, as the private sector's purpose in only profitability. But the profit in the regulated sector have to be fixed with clear conditions.

If a policy is good and related to the sector then how is it so that you could make more money thenstipulated? For Instance, if the return on investment is 70 per cent how can we make 90 per cent out of it?

And with the one-page policy paper, WAPDA has access to budgetary outlays which were restricted and loses started. That was the time When Gops required WAPDA to raise its own funds, that means ___ skinned the customers.

As a result of one page policy paper HUBCO was born which was a generator under the policy, it is not IPP which is misperceived as IPP. It was sponsored by World Bank with the idea that private entrepreneurs will supply comparatively cheaper electricity to the Pakistanis. The surprising fact is, the original offer of HUBCO was just 97 paisa/unit. Eventually, the Power Purchase Agreement (PPA) was signed for 6.1 cents which in those days were 234 paisa. The surprising fact is, this export one cent was on the basis of oil price of just 2850 Rs/ton which were 87000/ton three years ago. Therefore, automatically 6.1 cent has to be adjusted from 2850 to 87000 and it would become Rs 31. So the though was WAPDA must generate hydropower and the let the private sector take care of thermal generation. The managers were of the opinion, " we will not need much of the thermal generation" which was a mistakenly perceived idea.

CHANGING ARCHITECTURE

- **MLDAS spurred decisions to reform Power Sector and unbund WAPDA's Power Wing.**
- **Setting-up of PSCEs.**
- **Emergence of NEPRA as the Regulator.**
- **Setting-up of a Clearing House (CPPA), dorment till 2007.**
- **Handing-over of WAPDA's Management to ARMY.**
- **Chaos of 1998 to 2004**
- **Unitary command with a difference.**
- **Scuttling of so=called Reforms.**
- **Emergence of PEPCO as Independent Management Company in 2007.**

In 1909s Multi-Lateral Developmental Agencies (MLDA) they were of the opinion that government should not involve in it. It is none of the government's business to in business. There is a lot of difference between a developed country, under developed country and a developing country. Pakistan is a developing country. There is a need to reform the whole

structure of power sector. And they came up with the idea that the WAPDA's power wing which was looking after electricity board should be unbundled and corporatized they should be registered as companies. Corporationshave different powers when the WAPDA is fully autonomized which can make their own rules. And in out Lingo, "Authority" word has a lot of powers. The MLDAs urged to de-bundle WAPDA's power wing.

Within 1997 and 1998 all the area electricity boards in Pakistan were incorporated as a public limited companies into discos. Right from TESCO Peshawar to HESCO and K- Electric. It was also told once the companies are there, these will be regulated without the involvement of ministry, or finance ministry and science ministry. All these companies owned by the government of Pakistan will public limited. These will have their own BODs and these will be regulated by a regulator from the power sector or which came to be known as NEPRA (National Electric Power Regulatory Authority) and this was set-up under the NEPRA act of 1997. Within it a CCPA was also created the central power purchasing agency (CCPA) which unfortunately remained dormant till 2007. But, now it is an independent company and works very well.

According to CCPA the agreements of PPA would not be between Discos and power generators it will be between clearance houses, So CCPA will have PPA. So if the Disco is unable to pay, the CCPA will make the payment to generator otherwise, the generation will be effected. Though, it was a complex process, therefore, remained dormant till 2007. The scheme of the things was in the power sector reforms started in 1994 till 1997, it was programme that all governmententities will be privatized barring the entities the GENCOS will be sold, the Discos will be sold. And NTDC (National Transmission and Dispatch Company) would forever remain the governmental domain acting with authority whereas, GECOS and DISCOS will be privatized. We need to understand the reforms looks towards fast privatization of the companies that is why they said. WAPDA's shadow or umbrella for that matter was not needed anymore. They thought that everything will be done in three years. And once it is privatized the private owners will take care of everything.

Management Failure or Policy Debacle

Now is it a management failure or policy debacle on one hand WAPDA's power was de-bundled, the companied were corporatized and after privatization the government handed over WAPDA's management to the army. Two places taking place at the same time, imagine

the intellect of people for decision-making __ how the both things go parallel? This is the point when chaos began.

Debudeling WAPDA, corporatizations, man power transition from WAPDA to companies, and the PEPCO was to assure all these companies have access to human resource. And then all these companies were places for a block to privatization this was to be done in three years. Along with that WAPDAs management were handed over to army.

Army came in with operations and WIN(WAPDA Intelligence Network). It was chaos between 1998 to 2004. Because things were required to be done through the barrel of government. 19000 persons were thrown out of the jobs, demoted, posted and one of the security guard was transferred toGadu and then Gawadar because he had not been able to solute well. Now we came with the unitary Command Units through army. The day army take-over the chairman of WAPDA also became the chairman of PEPCO, BOD, and the member power WAPDA became the managing director PEPCO. So it was rolled up in one, it was the cutting of so-called reforms.

Now, the MLDAs become very upset about it, where is the plan. So in 2007, we need to separate PEPCO from WAPDA then two executive orders were came. The original PEPCO

PEPCO as the Change Manager

- Crises catapults PEPCO TO wapda's earlier place.
- Tug of war with Ministry of Water & Power.
- Ministry wins and takes over the day to day operation in 2011.
- The repository of good engineers, decades old support facilities get replaced with the Ministry's non-technical make-up.
- Power sector reduced to just Revenue Collection and slapping of surchages - 40% of the tariff for the industrial customer.
- Sector bereft of needed proessional managerial thrust.

executive order came in 1998 along with the executive orders forcorporatization of those companies. In 2007, another executive order came and within we had a new chairman of WAPDA who was told not to meddle in the power sector. The new chairman was assigned to

look after the work of developmental work of water. Separation from WAPDA took place in September 2007. And then again we started from the scratch with the agenda that all the companies should be privatized. But unfortunately power crisis came in 2007, so crisis put PEPCO to earlier place again, now PEPCO becomes WAPDA. A rivalry started between chairman WAPDA and MD, PEPCO, on the authority issues of water and power this leads to the alienation of both organizations.

In 2010 the ministry wins and takes day to day operations of PEPECO was the company everything should be done by. The new interventions with competent people and technologychanged the situation to a greater extent. Now, 37 entities could have access on ministry for technical makeup. The role of the power sector was just revenue collection which is throughan important factor. The development, and technology development were being neglected. We were not able to collect more than 6% of bills and we were 5% over the lost target, which was 14% or 15% and we were on 13 %. So 14% less recovery and 5% more losses translated into 220 billion Rs. So now the accountant comes in accounting chief of Pakistan to take actions against people who were not paying their bills. The question was, if people do not pay bill __ then who is getting the services .

220 were additional surcharge which presently equal to 40% of the tariff of industry consumers.

Conclusion

Institutional Decline in the Power Sector is evident.
Both Policy fault lines and Governance failure is seen!

Recommendations

Policy framework should be strategized

- There are set of processes to follow for making a policy, which nobody follows therefore the result is evident. Then there has to be a strategy which should be the part of policy. How do you strategized to assure the process, and where the plans, and once you is have plan then you come up with a road map with miles stones …. Nothing happens this way.
- There should be no short-cut of anything, and professional and technical people should be engaged.

Course Session – 8

Topic:	Viability and Affordability of Power Sector
Resource Person:	Dr. Mussadiq Malik
Date:	15 April. 2016
Day-Session:	5-1

Format and Methodology

The session started with the objective to run such courses for developing better understanding between the private and government sectors. The course provides the interactive session to bring viable options and strategies on front. The government is strategizing the power structure through involving different sources of investment and rehabilitation of plants.A long legacy of policy failures and a huge supply-demand gap is still a challenging task for governance and management.

Objective

- Exploring the viability and affordability of power sector
- Finding the potential of possible interventions for regulations, policy options and strategies

Problem Area

Pakistan's power sector is facing peculiar issues of policy hijack, procurement, elite hijack, and untargeted subsidies for elite which indicates that elite capture in Pakistan is very high. Distribution companies are full of flaws because most of the money is being stolen and another problem is circular debt which brings the viability of power sector to a question.

Untargeted subsidies cause a big problem in Pakistan. We have some 34 million connections and only 135 or 125 from WAPDA which constitute 20 million were industrial connections. 25 per cent of the total subsidy is given to these 120,000 connections.The richest people are getting 24 per cent of the total national subsidy, when the total subsidy is 300 billion USD. How can a government give a billion dollar subsidy to the richest people of Pakistan? The idea is good, but only executable to the rich countries not in a Pakistan being a poor country.

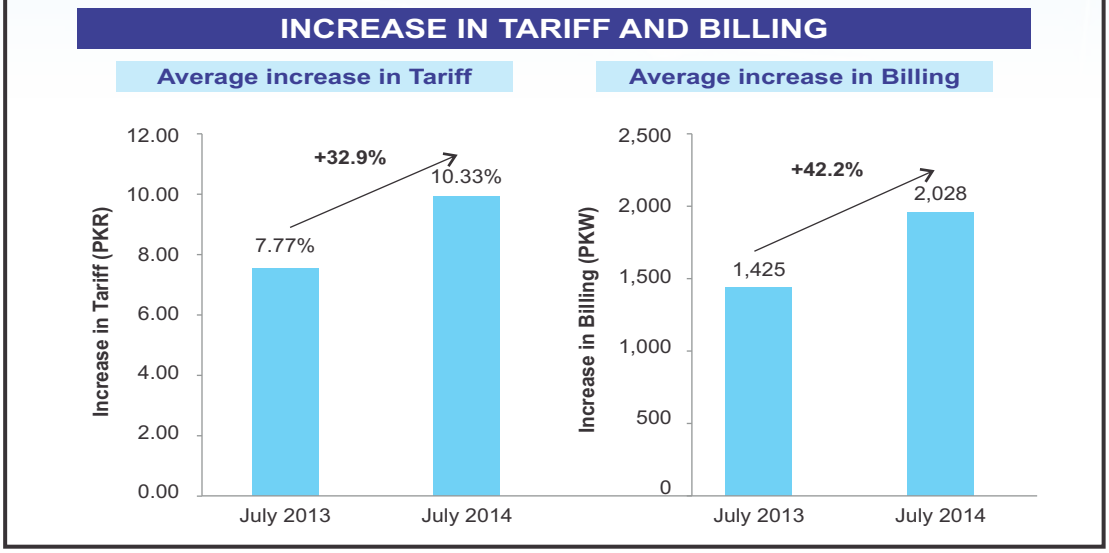
APeculiar Case of Elite Capture in Policy

Considering the factors it is evident that power sector has to be restructured. 5 billion dollars have to be given just to square out our goals and that is not even 100% as we are facing circular debt. You are imparting various companied for loan which have not been paid off so 5 billion is just to pay off or extract from people to balance the payments. Rational regime of subsidy should be take place.

Distribution companies are also creating problems, when the money is not being collected, and whatever energy are producing is being stolen. If you are selling 75%, and the money is being collected out of it 85% then this strategy cannot be viable.

Restructuring the sector is also a difficult task, one option is to increase the tariff, cost of electricity for affordability. A unit cost is Rs 13 which is being selling off at Rs 11 so very unit is giving loss of Rs 2. The tariff issues need to be resolved and the second difficult decision is stealing money or print money to or borrow 4 billion dollars to pay off the people so that we can start producing electricity.

While the average increase in tariff since July 2011 to July 2014 is 33%, the increase in billing stands at 42% drawn primarily by an increase in supply of energy



These are quite tough decisions for the government. In July 2013, the tariff was increased the price was Rs 7 and 77 cents because a large chunk, 68 per cent of people in Pakistan were getting electricity supply at Rs 2. If the people will receive electricity at Rs 2 when the cost is Rs.9. This leads to widening up a gap naturally. To counter this issue, tariff was blended for the people who are affluently using electricity and industry people. A straight increase in tariff was implemented which were Rs 7 .77 which was about 33 per cent increase in tariff. Though, a tough decision from the government which has increased the burden on consumer. The increase in tariff was 33 per cent but the burden on consumer was 42.2 per cent. So the consumer had to pay 40 per cent more for consumption which affected the affordability of electricity.

In July average billing was 1425, and the tariff was increased to 165 Rs and the slab advantage was taken off. The slab advantage is, for the first 50 units at Rs 2, and from the 51st unit to 100 unit was basically for Rs.4. And then from 101 and to 300 the cost was Rs 6. The government took away the slab advantage. If the consumption is 300 or 400 units then there is only one slab advantage of paying Rs.6 till 300 units and then the tariff gradually increases. Resultantly, more electricity started producing, which led to more consumption of electricity even if the price is high.

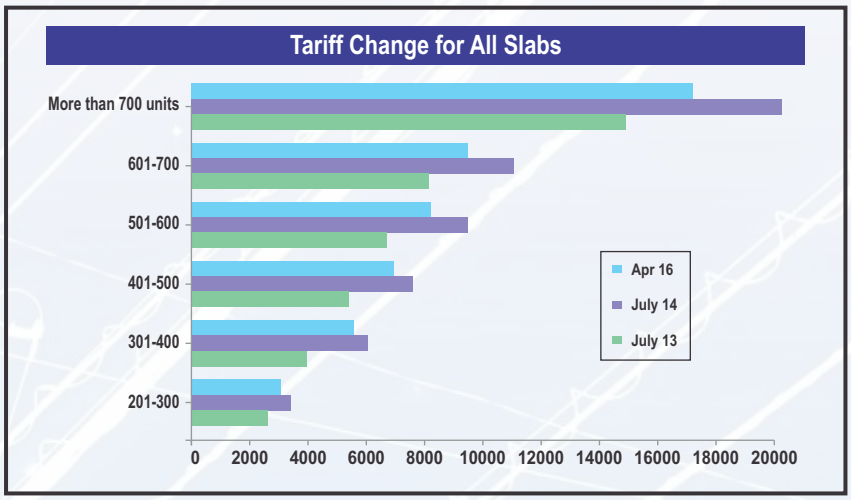
From the economic perspective, the relation between supply and price only exists when there is enough supply but in Pakistan's scenario situation is different people increases the utilization when there is more supply. When the load shedding is 14 hours and relief hours are 3, and in 9 hours of electricity, 3 hours will be peak hours of electricity consumption. When there was more electricity produced then people used more therefore, Rs.133 was the impact of using more electricity. Therefore, increase in tariff, taking away of slab advantage, and increase in supply which led to more utilization in average bill which included those people who only use less than 50 units. Average bill in July 2013-2014 were increased from 1,425 to 2028 with one policy adjustment.

This was the affordability impact which has the hope or aspiration wasif the economic burden of using electricity will be increased then the distribution companies and transmission system would be fixed. Whatever increase in the way of cost would come down by the theft, losses and collection. The things have not been improved much in last years which has affected the viability of power sector, but still a slight different has been achieved.

In a survey, a household annual income is compared to energy utilization. In principle, when the household income increases, the energy utilization should also be increased. That is basically algorithm which is used, whereas, the trend of graph is against the algorithm. This shows who earns more than 100,000, the burden of electricity increases by 80 per cent then you have more viability from the consumer's perspective more affordability. Because people save from their disposable income spending. That reveals, the policies are not mode considering the end consumer's perspective. Polices making process neglects poor's perspective. Restructuring of tariff would not trying to promote the burden on poor people and less on the rich. They are just making slab adjustments and making the map. The persons who suffer do not appear in the map. A poor man's voice is unheard in Pakistan while policy making process, the poor remains invisible and voiceless.

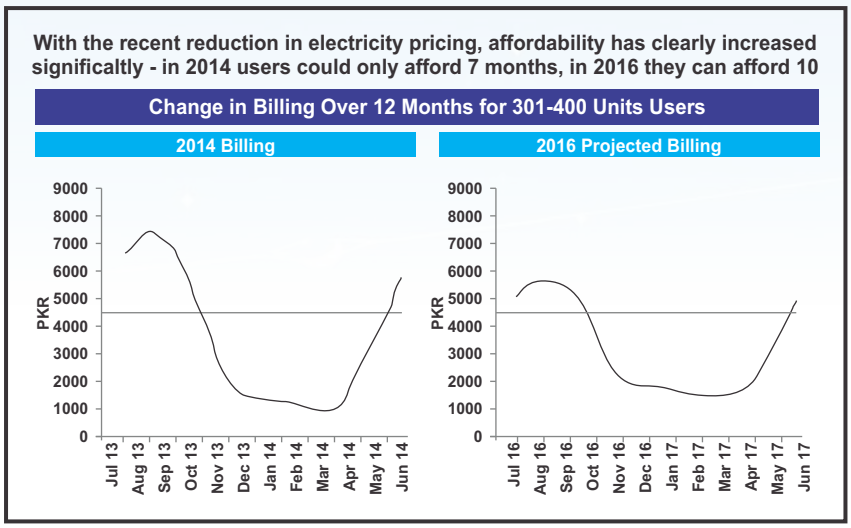
The billing is done on estimation neither the policy has voice for a poor man nor implementation. Household visibility in three months has reached to and people went to sit-ins. The art of policymaking follows a process feasibility and strategy. Cost-benefit analysis and cost-effectiveness is required which is being neglected in Pakistan and cause fragmentation in the state.

The GoP's efforts to bring relief to Pakistanis is resulting in more affordable electricity for all users across the board.



The bill has decreased due to two component i- natural decline in bill produce advatnges, and ii- increase in merit advatge because of impriving efficency. The bill in july 2013 was Rs 1700 that have increased to Rs 2200, and now the bill has decreased to Rs 2000 due to the efficency of the department.

The both advatges decreased the bill to Rs 225. Similarly, the slab of 301-400, the bill was Rs 2800 in 2013, which has increased to Rs 4500, that deacredsed to Rs 4100 in 2016. The same fashion is obersrved in the resprtive slabs and decrease in bills because of the efficency improvement of two years.



Conclusion

Untargetedsubsidies which creates mess in the Discos and cause circular debt should be controlled. Unviable power sector Policy; poor- centric on the surface but middle class became the victim because policy making does not based on evidence. We are not trained to

analyze things instead we are trained to administer things without considering externalities as we are not prone to do this.

Recommendations

- Policy should be evidence based instead of opinion based. We do not make evidence based policy, there are no policy rooms, people do not have capacity, they can just run administration.
- Decisions should be based on empirical analysis
- Formal process should be developed to make people responsible for implementation of all projects based on the ground realities ___We do have a process of doing things, but in the whole Pakistan, there is not a single formal process which is beneficiary centric.
- The person who have responsibility should be given authority for resource allocation and all other related matters. Any distortion in the process cause problems.

EVALUATION OF THE COURSE

Inquiry	Response Category	Percentage	
1- Do you think this course was useful for you?			
	Somewhat Useful	10	
	Quite Useful	20	
	Very Useful	70	
2- Was attending this training worth your time?			
	Moderate	10	
	Quite Useful	22	
	Very Useful	70	
3- Approximately how much information you can apply at your work place?			
	Almost Always	50	
	Sometimes	20	
	Every once in a While	30	
4- In your opinion, is "Political Economy of Power Sector: Policies and Governance" an important issue for Pakistan.			
	Useful	No response	
	Quite Useful	No response	
	Very Useful	100	
5- Is the course address the problem and mitigation strategies of power sector?			
	Moderately	No response	
	Greater Extent	30	
	Comprehensively	70	
6- Please rate the course content on the following. (Place tick mark in the appropriate space.)			
	Good (%)	Very Good (%)	Excellent (%)
In line with Objective	10	50	40
Suitable to my level of experience	20	40	40
Up-to-date and forward-looking	10	30	60
Consistent with description	10	20	60
Understandable	20	No response	80
Included sufficient examples	10	40	50
Overall rating of workshop content	10	30	60
7- Who would you recommend as guest speaker again?			
	Response Category	Ranking	Percentage
	Dr. Musadik Malik	1	100
	Mr. Tahir Basharat Cheema	2	70
	Mr. Zafar Mahmood	3	60
	Mr. Omer Rasool	4	60
	Dr. Gulfaraz Ahmed	5	50
	Mr. MaqsoodShafiq Qureshi	6	50
	Syed Akhtar Ali	7	40
	Syed TanzeemHussain Naqvi	8	20

8-Please rate the course on the following items:			
	Good	**Very Good**	**Excellent**
Organization	**10**	**40**	**40**
Pace of delivery	**10**	**40**	**50**
Audio Visual?	**No response**	**30**	**70**
9- Please rate the course on the following items:			
	Good	**Very Good**	**Excellent**
a. Use of Instructional aid	**No response**	**80**	**10**
b. Creating interest in topic	**20**	**50**	**30**
c. Involvement of participants	**No response**	**40**	**60**
d. Reading Material	**20**	**20**	**40**
10- Who was the best speaker in your opinion?			
Rank the Speakers		**Ranking**	
	Dr. Musadik Malik	**1**	
	Mr. Tahir Basharat Cheema	**2**	
	Dr. Gulfaraz Ahmed	**3**	
	Syed Akhtar Ali	**4**	
	Mr. Omer Rasool	**5**	
	Mr. MaqsoodShafiq Qureshi	**6**	
	Mr. Zafar Mahmood	**7**	
	Syed TanzeemHussain Naqvi	**8**	
11- Rank order the topics in terms of importance			
	Ranking	**Percentage**	
1. Conservation & Renewable Energy:	**1**	**52**	
2. Case Study of Service delivery in Power Sector	**2**	**51**	
3. Power Generation Projects Governance and Efficiency	**3**	**49**	
4. Institutional Decline in Power Sector: Is it a Policy Fault Line or Governance Issue?	**4**	**48**	
5. What Measures are Suitable for Power Crisis and	**5**	**43**	
6. Viability & Affordability of Power Sector:	**6**	**44**	
7. Energy Crisis: Options & Opportunities:	**7**	**38**	
8. Strategize Energy Crises through Hydro Power Generation:	**8**	**37**	
12- How would you rate the following?			
	Good	**Very Good**	**Excellent**
a. Snacks at break	**20**	**60**	**10**
b. Meals	**20**	**40**	**20**
c. Lodging	**No response**	**20**	**30**
d. Parking	**20**	**20**	**40**
e. Service	**10**	**20**	**50**

13- Should this kind of course need to be organized again?	Response Category	Percentage	
	Agree	30	
	Strongly Agree	60	
14- Would you recommend this course to others?			
	Yes	90	
	No	No response	
15- How would you rate the course over all?			
	Good	No response	
	Very Good	20	
	Excellent	60	

16-Any Suggestion for Improvement

- All the participants should be provided an opportunity to speak on the rostrum to express their subjective views.
- A Case Study for the K-Electric may be included in the next course regarding light transformation from a loss-making to profitable entity and its failures in term of original objectives of the government at the time of its privatization.
- All the important stakeholders including Minister for Water and Power, Security, Chairman WAPDA, advisor to the Prime Minister on energy should be called for the panel discussion.
- Courses on water management and food security should also be conducted.
- Reading material for the course should also be provided
- A brief profile of guest speakers should be communicated to the participants before the course as it helps a lot
- Soft copies of presentations should also be provided to the participants
- An Excellent Programme
- Keep it Up

Mrs. SANIYA AWAIS	Managing Director, Punjab Power Development Board, Lahore.
Mr. AFTAB HABIB	Director General, NISTE, Government of Pakistan, Islamabad.
Dr. SARFRAZ KHAWAJA	Dean, Executive Development Institute, Lahore
Mr. MUHAMMAD ISMAIL QURESHI	Rector, National School of Public Policy, Lahore
RAI IJAZ ALI ZAIGHAM	Director General (Admin), National School of Public Policy, Lahore
Engr. SYED TANZEEM H. NAQVI	Ex-Member Power WAPDA/Ex-Chairman-M.D, KESC, Lahore
Ms. SAMEERA YASIN	Director General, Training & Research, FBR, Lahore.
Ms. MISBAH SHAMAZ	IT/AV Officer, Executive Development Institute, Lahore
Mr. SAQIB ALEEM	Director General, National Language Promotion Deptt, Islamabad.
Dr. TARIK AHMAD KHOKHAR	Inspector General of Police), Lahore.
Mr. OMAR KAUSER MALIK	CEO/Bio-Policy Expert, Ittehad Life Sciences-ILS, Lahore.
Mr. AAMER KAMAL	Ex-Coordination Incharge, (Special Operation Wing), NAB Punjab.
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