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From the Director's Desk

The Centre for Public Policy and Governance (CPPG) has been organizing seminars and policy dialogues on the deepening energy crisis in Pakistan for the past two years. We believe that by hosting these seminars, policy dialogues and by inviting and engaging public officials and other stake-holders, we have contributed in raising level of awareness on the various dimensions of energy problems in Pakistan. We hope that deliberations on energy issues raised in our Quarterly, will serve as an advocacy tool for all those who aim to see improvements in energy sector. This Special Issue is of immense value as it offers perspectives of public officials, energy experts, civil society activists, media, business and concerned citizens. The PML-N government has announced the National Power Policy 2013. However, the real test would be how this policy is implemented and enforced. CPPG is contributing by sharing an analysis of the NPP 2013 to help improve its content quality and implementation processes. We invite you to join us in improving the governance and delivery of services in the energy sector by carefully assessing, examining and ensuring the implementation of the NPP 2013. As always we welcome any critique, comments and recommendations for improving the quality and content of our Quarterly.

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CENTRE FOR PUBLIC POLICY AND GOVERNANCE

Assessing National Power Policy 2013

:Saeed Shafqat & Raheem ul Haque

There is growing consensus and realization among scholars, policy makers, energy experts, private entrepreneurs that without harnessing energy crisis, no meaningful economic growth and sustainable development is likely to occur in Pakistan. Energy is critical for political stability, survival and economic growth of Pakistan. The Woodrow Wilson International Center put out a study in 2006 titled "Fueling The Future: Meeting Pakistan's Energy Needs in the 21st Century." The study had contributions from Pakistani and American experts and covered almost all dimensions of the subject. The study underscored that for growth and economic development, Pakistan needed to plan energy conservation, ensure stable and cheap supply and invest in human resource capacity to improve governance of the energy sector. The study drew attention towards renewable energy sources, regional cooperation with South and Central Asian States, and incentivizing the national and international private sector to invest in the energy sector[1]. However, the analysis and wide ranging recommendations of this study went virtually unnoticed in the country. Now, time is running out for 'fueling the future'—the energy needs must be addressed based on the immediate, medium and long term goals as the costs indicated by Table 1 are unbearable for Pakistan with its growing population needs.

The manifestos of almost all major political parties issued before the May 2013 elections were unanimous in recognizing energy crisis as a major impediment for socio-economic development. Yet they remained vague and nebulous in providing any policy framework for managing the energy crisis. For example, the PML-N manifesto recognized that the energy crisis was 'causing unbearable suffering to the common man' and asserted: "The annual cost of load-shedding was estimated in 2010 at Rs. 500 billion (US$ 5 billion), a loss of a million jobs and at least US$ 2.8 billion reduction in exports". The Manifesto claimed that Pakistan had the second largest coal reserves in the world, over 300 million barrels of proven oil reserves, sufficient gas and "our rivers have potential hydropower capacity of at least 40,000 MW." It promised reforms of National Electric Power Regulatory Authority (NEPRA), Distribution Companies (DISCOs), Generation Companies (GENCOs), Oil and Gas Regulatory Authority (OGRA) and "permanent elimination of circular debt". While the issue of reforms is yet to be addressed, the PML-N government revealed its intent within 60 days of coming to power by clearing the circular debt worth Rs. 480 Billion[2], thus kick starting power production to the relief of citizens.

Table 1: Outage Costs

Sector	National outage Cost (Rs Billion)	Sectoral Value Added (Rs Billion)	Outage Costs as % of Value Added
Agriculture	89	3899	2.3
Industry	314	(1574)*	(5.7)*
Large-Scale	231	3315**	9.5
Small-Scale	83	2661	8.7
Commercial/ Services	472	653	12.7

*only the crop sector
**excluding slaughtering

Source: Economic Costs of Power Loadshedding in Pakistan. Institute of Public Policy 2013

In haste and without sufficient consultation with stake holders, provincial governments and experts, the Government announced the National Power Policy 2013 (NPP2013). It envisions "Pakistan will develop the most efficient and consumer centric power generation, transmission, and distribution system that meets the needs of its population and boosts its economy in a sustainable and affordable manner". It is ironic that the PML-N government had been in power (2008-2013) in Punjab—the largest province and yet little preparation and home work seemed to have been done while announcing the NPP 2013 and other policies. There are significant gaps between the electoral promise on resolution of energy crisis and the actual energy policy. The PML-N election manifesto promised to merge the Ministries of Water & Power and Petroleum & Natural Resources into a single Ministry of Energy and National Resources but NPP 2013 shied away from that declared position. Instead it proposed an Internal Coordination Committee between multiple Ministries for integrated planning to be overseen by the Council

of Common Interests (CCI).

Energy Mix: Resource Constraint or Bad Policy?

It is ironic that an energy crisis has erupted in a country which has the world's second largest coal reserves amounting to 480 billion barrels of oil worth $25 trillion[3], a potential for 100,000 MW hydropower generation[4] and untapped gas and oil reserves in Baluchistan. Evidently, the problem is not dearth of resources but bad policy choice, mismanagement, lack of vision and planning. Over the past three decades privatization and de-regulation of the energy sector led to an energy mix that has escalated the energy production costs; the current primary energy mix (inclusive or power) is 49% Natural Gas, 11.7% Hydro and Nuclear, 7.3% Coal, and 32% Crude Oil, POL, LPG[5]. Thus it has a significant expensive oil component, 82%[6] of which is imported leading to the actual cost of Rs. 14.66[7] per power unit. This current mix is an outcome of both non-implementations of the various energy plans (1992, 1994, 2004, 2011) based on indigenous and cheaper fuels as well as of the 1994 Energy Policy. The 1994 policy invited investments irrespective of fuel while providing a cost plus margin sovereign guarantee to the investor. This clearly indicates that the issue is not dearth of resources but an inability to plan, manage and band together human resources capability. The NPP 2013 does not spell out any clear strategy or plan as to how the current injudicious energy mix will be rectified.

> "...the problem is not dearth of resources but bad policy choice, mismanagement, lack of vision and planning."

NPP 2013: Assessment and Critique

We would assess and evaluate the NPP 2013 under the broad umbrella of Governance, specifically focusing on four components; Regulation, Policy Framework, Human Resource Capacity and the Culture of Theft. It may be underscored at the outset that the PML-N Government has announced a policy without an accompanying strategy or an execution plan. Thus based on the analysis, findings, interpretations and recommendations of experts, our evaluation is confined to the above four components.

Regulation:

The public sector utilities had dominated the regulation of energy sector in the country from the 1950's to early 1990's. Following de-regulation and de-concentration of Water and Power Development Authority (WAPDA), the National Electric Power Regulatory Authority (NEPRA) was created in December 1997. NEPRA was to be an autonomous and independent regulatory authority and the expectation was that it will improve the regulation, management and delivery of energy supply in the country[8]. However, over the past fifteen years the gap between the promise and reality has widened. Instead of improving regulation, management and service delivery, NEPRA has deepened energy crisis in the country through misgovernance. Lodhi persuasively argues that NEPRA has not performed its regulatory functions; which include evaluation of the annual performance of DISCOs. Decision making at NEPRA has been poor, which causes inordinate delays in tariff pricing further contributing to the circular debt. Zaidi observes that this is just the tip of the iceberg; he is correct in pointing out that the unbundling of WAPDA (which encompassed all functions from Planning, Generation, Transmission, Distribution and Regulation) was done in haste and without sufficient research and consultation. What kind of relationship will the more than dozen new independent companies have with each other and NEPRA was not fully thought through. Lodhi agreeing with Zaidi gives a more nuanced explanation of NEPRA's ineffectiveness and slackness; he contends that the plan was not properly implemented because of a lack of institutional memory. The new members of NEPRA had no memory of the original plans about the energy sector, regulatory roles of WAPDA and KESC, and were least equipped to deal with new realities that confronted the de-regulated power sector in the country.

In addition to personnel management and regulation issues, NEPRA's functioning has been hampered by persistent political interference by the politicians, and civil and military governments. Thus, domestic and international pressures have constrained efficient and smooth functioning of NEPRA. As noted above, the NPP 2013 boldly acknowledges the need for reforming NEPRA & OGRA, but identifies only two concrete steps – (1) reducing the establishment period of base tariff from 8-10 months to 90 days and (2) the creation of an independent board. The lofty claim to 'develop a world class regulatory authority',

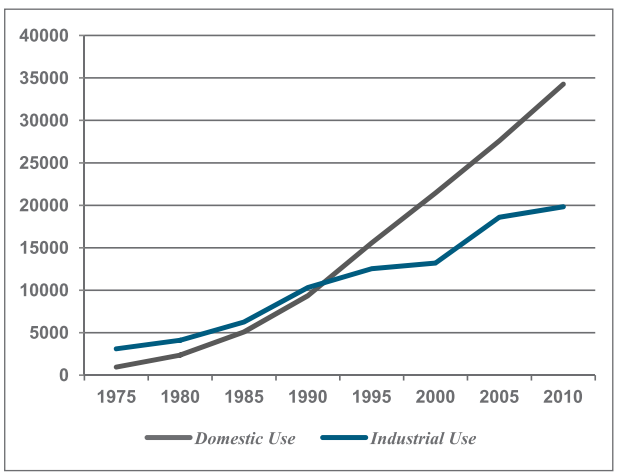
sounds hollow. Contrary to the promise in its manifesto, the NPP 2013 is also less forthcoming and convincing on plans for decentralization of the energy sector as the policy only suggests a possibility of wholesale market with regional networks for multiple buyers and sellers whereby DISCOs can buy directly from the generation companies. Instead the main thrust of the NPP 2013 appears to be privatization of DISCOs and GENCOs. Here two points merit attention. First, decentralization, de-regulation and privatization require prudent regulation and effective enforcement. Unless, the current haphazard institutional mechanism is streamlined with the role of each organization (including the Government) brought under the regulatory framework, any steps towards privatization would remain unfruitful. Second, privatization before decentralization of the power sector may not be a good idea as the experience of lingering disagreement of 700 MW[9] between the state and KESC clearly indicates.

> “...the NPP 2013 is also less forthcoming and convincing on plans for decentralization of the energy sector”

Policy Framework:

Within the Policy domain, an integrated energy policy is required which includes Power, Gas, Nuclear and Alternate Energy. This clearly demands an improved level of institutional collaboration; however, the current institutional landscape is inundated by multiple ministries as well as multiple regulatory bodies. The very title National Power Policy 2013 evokes lack of clarity of vision and does not rouse confidence in Government's commitment to an integrated energy policy. Due to this inherent weakness, the policy glosses over another crucial aspect and that is the changing energy consumption pattern in the country. It is pertinent to note that domestic power usage in Pakistan has risen to 47%, while the industrial has declined to 27%[10]. This is an alarming trend as domestic consumption is rising faster than industrial consumption. This consumption pattern needs to be rationalized if not reversed, to ensure that industry drives the economy in terms of employment and growth rather than only satisfying the domestic consumer. Recognizing this as the “fundamental problem” of our economy, Kaiser Bengali has aptly observed, “Pakistan has become a consumption society, without a corresponding production base to support the desired level of consumption... we cannot consume what we do not produce”.[11]

Figure 1: Electricity consumption by sector (in GWh) 1975-2010



Source: Ministry of Petroleum & Natural Resource, Energy Yearbook (various issues) from SPDC Working Paper 7 - Agenda for Sustained Economic Revival.

It is noteworthy that the NPP 2013 aims to shift CNG usage from transport to power generation. Yet the policy hardly identifies any mechanism that would lead to such a smooth shift as gas is still heavily underpriced. More importantly, conservation initiatives also need to be integrated along with cross rationalization of fuel prices to ensure that power tariff rates are in line with rising gas rates.

Managing Human Resource Capacity:

It is disturbing to point out that the NPP 2013 glosses over the need for improvements in human resource capacity in the power sector. The policy alludes to managing these HR needs through a combination of Energy Services Company audits and improvement, and Performance Contracts in the name of efficiency. Human Resource capacity has not correspondingly increased with de-regulation and privatization of power sector in the country. Ahmad draws attention towards this by focusing on poor project management. He contends that the lack of effective project structuring, planning, financing and implementation are serious issues plaguing the energy sector and demands

investment in building human resource capacity to ensure successful completion of various ongoing projects. Zaidi is equally forceful in pointing out that the DISCOs don't have the capacity to write an Energy Purchase Agreement (EPA) thus holding back investments. Lodhi is skeptical about the professional skills of those who manage the DISCOs. He contends that the DISCOs could not be run professionally because the staff lacks the thinking, attitude and capacity required for it. As noted earlier the issue of human resource capacity is a direct outcome of the breakup of WAPDA in haste and without adequate thinking on who will build the capacity of Area Boards (departments), which would become independent corporations overnight without a capacity building exercise. Supposedly, the subsequent governments and the DISCOs were expected to fulfill this responsibility. Were they trained or prepared in any way to take on new responsibilities?

It is ironic and unfortunate that NPP 2013 is also glaringly oblivious of building human resource capacity in the energy sector. The NPP 2013 does pay attention to technology and infrastructure development. It propounds to install smart meters and online monitoring; both are important and welcome initiatives but no substitute for building human capacity. For example, the policy envisions Relationship Managers providing One Window Operation to the customer, however, they will be able to facilitate only if the back office staff is professionally trained, qualified and effective.

> "PML-N Government has announced a policy without an accompanying strategy or an execution plan."

Institutionalization of a Culture of Theft and Non-Payment:

The NPP 2013 provides better regulatory framework to plug theft, corruption and non-payment. The Policy provides for a feeder level technical solution whereby the Executive Engineer (XEN) can be held accountable for recovery, instituting performance contracts, conducting external professional audits of companies, and holding non-paid amounts of provincial government departments from the National Finance Commission (NFC). Similarly, websites as envisioned in the policy can help in terms of improving communication. However, a much more important task would be to provide accurate and credible data for select stages of the business process as agreed with independent experts. This would be a critical element in ensuring accountability and transparency.

> "The PML-N election manifesto promised to merge the Ministries of Water & Power and Petroleum & Natural Resources into a single Ministry of Energy and National Resources but NPP 2013 shied away from that declared position."

Ahmad has pointed out that theft in power and gas sector constitute about 45% of the Circular Debt, while non-payment by the provinces 18%, and government departments and private sector another 7%[12]. While the policy lays out good principles and best practices to curb theft, corruption and mismanagement, we want to reiterate that professional management and improved company processes are more important in countering a culture of corruption in DISCOs and other organizations. Thus, there is both room and need for improvement in NPP 2013 in this direction.

Improving Governance of the Energy Sector:

Overall, the NPP 2013 correctly indentifies the issues at hand but it relies heavily on a technical solution. The underlying problem was rooted in governance and management of human resources at all levels. It constitutes regulatory, institutional, cultural and behavioral aspects. Yet in the policy the technical component is given preference over human resource capacity; formulation of standards is equated with conservation strategy; independent boards are considered sufficient for good governance of organizations and the internal coordination committee comprising of various government departments is presented as a means for integrated energy policy. The Government's panacea for good governance seems to be privatization, which could be a disaster in a non-regulated and imperfect energy market of Pakistan. This implies that privatization should be followed by prudent regulation—a regulation that protects the rights of private investor, ensures justice and fairness to the ordinary consumer and

maximizes consultation with stakeholders and experts. The NPP 2013 does not have an associated strategy or plan of execution, which could jeopardize the efficacy of this policy like its predecessors. At this stage when the policy has been announced and implementation processes are still being worked out, the Government would be advised to involve Pakistan's energy experts to deliberate on the policy and incorporate the work done on earlier energy plans. Such an exercise could help improve the implementation plans for NPP 2013.

> "...involve Pakistan's energy experts to deliberate on the policy and incorporate the work done on earlier energy plans"

In our assessment, there is a dire need for integrated energy sector governance so that policy, planning and management act in concert rather than in competition across various ministries, government departments and associated bureaucracies. A coordination committee for tasks envisioned in the Policy would not make much of a difference in meeting Pakistan's 21st century energy needs. This requires collaborative research, analysis and implementation of an integrated energy plan having a broader national consensus and stake holder's ownership rather than the shared decision making and responsibilities of a committee. We recommend that the following steps could strengthen and streamline the implementation of NPP 2013:

1. Establish competent Board of Governors, which reflect a mix of professionals, technical experts and practitioners and not ones filled with political appointees and retired bureaucrats.
2. Fill all open positions with professional management with security of tenure.
3. Ensure merit and non-interference by the government and bureaucracy.
4. Accountability based on service contracts and performance based on achievement of targets/goals.
5. The Policy's wording of instituting independent boards is too general; it is advisable to constitute the composition of the board.
6. Address issues of institutional memory by creating staggered tenure of the board and senior management.
7. Ensure affordable energy price keeping in view of IMF conditionalities.
8. Design and plan reforms of energy sector's governance and management.

End Notes

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11. Kaiser Bengali, Agenda for Sustained Economic Revival (SPDC Working Paper No:7 Draft for Public Discussion) (Karachi: Social Policy and Development Centre,2013) pp1&11-12
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:Dr. Akmal Hussain, an economist, author and social activist and Engineer Hassan Jaffar Zaidi, CEO, Power Planners International, an energy consultancy firm, deliberated on the impact of structural complexity, institutional bottlenecks, governance and organizational management related to the power sector in a CPPG policy dialogue titled "Institutional Bottlenecks and Management Issues in the Energy Sector" on July 25, 2013.

Dr. Akmal Hussain began by stating that an energy crisis emerging in a country with a 100,000 MW hydropower potential was testament to the management failure of past governments and institutions. Having advised various governments and prime ministers since 1988, he pin pointed successive governments' focus on short-term solutions while ignoring long term problems as the basis of the current energy crisis. Quoting from his 1988 book, he stated that academics had highlighted the coming crises as early as 1988 but a policy with long-term implications was never considered because each government was only interested in short term results. However, governments could not be singled out as it was the responsibility of the institutional structure to ensure that governments worked on strategies for a permanent solution to the crises. He gave the example of mature states where the institutional structure obliged the government of the day to undertake policies for the long term while addressing immediate concerns such that governments did not merely become fire fighting units.

Hussain then elaborated on three aspects of the origin of the crises, which had unleashed mass scale human misery through increased poverty and unemployment, a serious balance of payment crises and pulling down of economic growth by 3%. One, the failure to invest in hydroelectric power in the decade of 80s and 90s had led to a shift in the energy mix from 60% hydro in the 1960s to 30% in 2009-10 leading to the use of high cost energy sources, and costs rose further with the increase in oil prices. He put the responsibility for this on the lack of long-term planning and research as the gestation period for hydroelectric dams was 8-10 years, and a failure to invest in them led to short term solution of using furnace oil and gas thermal power plants to produce electricity. Two, economic growth in the Musharraf era was not supported by growth in the installed power capacity. Estimates showed that 1% GDP growth should accompany at least 1.5% yearly growth in installed power capacity. But from 2002-07 when average GDP growth rate was 7%, the average annual installed power capacity growth rate was just 2.2% leading to growth un-sustainability. Three, the failure to invest in the maintenance and up-gradation of existing power plants led to available production capacity being half of the installed capacity. Because there was no obvious shortage of electricity during the Musharraf period, the public sector did not focus on investing in the power sector while the IPPs did not upgrade their plants owing to a lack of investment security either because of an uncertain government policy or an uncertain political future.

> "...institutional restructuring and governance were pre-requisites for a successful implementation of policy."

The above stated issues existed when the PPP government came into power in 2008, however the scale of the problem was much greater than its management capacity. The cost of electricity production was almost Rs. 14 per unit and if tariffs were fixed equal to cost, electricity prices would have risen by 50% possibly leading to riots. Thus the government only did firefighting and agreed to subsidize power distribution companies by Rs. 5 per unit keeping the consumer cost to Rs. 9 per unit. But the cost of subsidy (Rs. 5 per unit) was too high and consequently the government failed to pay the distribution companies who in turn couldn't pay power production companies

who couldn't pay the oil companies leading to an oil shortage. This came to be termed "Circular Debt" with the consequence that power couldn't be produced even from the existing installed capacity.

> "... rather than following the NPP, the 1994 Energy Policy instead followed the neo-liberal dictates of global capitalism."

Hussain then articulated recommendations for the short and long term. He stated three recommendations for the long term: first, investing in hydroelectric power production to change the production mix for cheaper electricity; second, investing in more efficient transmission technologies; and three, restructuring the entire institutional framework of the power sector for a more efficient transmission and load management strategy and for stopping theft. Putting greater stress on the need for immediate relief, he made five short term suggestions. Firstly, mobilize finances to get rid of the Circular Debt estimated at Rs. 870B (government figures put it at Rs. 500B) to produce at least the level of available capacity, which can add 5,000 MW and would suffice the existing suppressed demand levels of about 4,978 MW. Secondly, improve available capacity to installed capacity by first analyzing and identifying the supply, maintenance and repair constraints of power production companies to reach installed capacity and then where possible conduct interventions by supplying funds, material or technical expertise to ensure production up to installed capacity at a reasonable efficiency level. Thirdly, stop theft by changing the organizational and monitoring system of distribution companies and by improving transmission technology to decrease losses. Out of the 28-30% attributed to line losses, only 7% was due to transmission technology while the rest 23% was theft. The DISCOs lacked the basic human resource capacity to run efficiently while existing rules and enforcement mechanisms allowed massive theft as even an XEN could sell uninterrupted electricity to large buyers while shifting the load burden to other consumers and pocketing the money. Fourthly, conduct better load management by efficiently managing shortage of electricity in a just and equitable manner ensuring minimum human suffering through scheduled load shedding. The DISCOs didn't have a metering system or capacity to calculate electricity flow on an hourly basis and could only conduct a monthly estimate. Thus as they tried to reorganize the distribution of electricity to manage hourly fluctuations in the supply system and to further squeeze more electricity out of the already stretched system, it led to tripping - unscheduled load shedding. Fifthly, install smart meters at the consumer level to encourage energy conservation as these meters can calculate consumption according to different times of the day and thus allow variable pricing at peak versus normal hours. Additionally these can also ensure just and equitable mechanism for subsidizing low-end consumers.

> "...it was the responsibility of the institutional structure to ensure that governments worked on strategies for a permanent solution to the crises."

In conclusion, he agreed with the strategy adopted by the new PML-N government to eliminate more than half of the circular debt in a week raising production by about 5,000 MW and also with the government's stated goals: 1. Build the power generation capacity that can meet the country's needs; 2. Ensure generation of inexpensive and affordable electricity for domestic, commercial and industrial use; 3. Minimize pilferage and adulteration in fuel supply; 4. Promote world class efficiency in power generation; 5. Create a cutting edge transmission network; 6. Align ministries in the energy sector and improve governance. However, he argued that the challenge for the current government was to develop an effective implementation mechanism for achieving these policy goals as theft had become institutionalized creating a secondary market for energy. He articulated that institutional restructuring and governance were pre-requisites for a successful implementation of policy. Defining an institution as a set of rules embodying incentives and disincentives to shape the behavior of individuals and organizations, he argued for an institutional restructure of the power sector involving rules, regulations, systems and contracts to ensure efficiency. Additionally, a governance framework with just the right incentives, transparent, equitable and

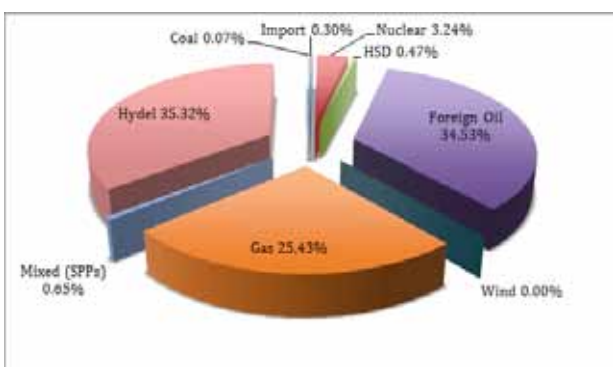
enforceable rules, and efficient mechanisms was needed to attract foreign investment. Suggesting that $3 trillion crossed international borders every 24 hours looking for good investments, he argued that with the right governance framework, Pakistan could attract private investment in cutting edge technology to improve transmission and distribution systems and in coal-based plants, run of the river plants and hydropower dams.

Table 1: Electricity Supply and Demand

Year	National Sales (GWh)	National Load Shedding (GWh)	Total National Demand (GWh)	Shedding as % of National Demand
2003	52,661	-	52,661	0.0%
2004	57,467	520	57,986	0.9%
2005	61,247	265	61,512	0.4%
2006	67,608	1,208	68,815	1.8%
2007	71,947	2,040	73,982	2.8%
2008	72,518	12,578	85,096	14.8%
2009	69,668	18,222	87,890	20.7%
2010	73,595	21,823	95,238	22.9%
2011	76,294	26,703	102,997	26.0%
2012	77,184	29,330	106,514	27.5%

Engineer Hassan Jaffar Zaidi continued the focus on the institutional framework of energy sector by elaborating on the historical evolution of its current structure. He stated that till the mid 90s, Pakistan was on track planning for reserves and had a strong transmission system of 500 KV lines compared to that of North America, in addition to

Figure 1: Fuel Wise Power Generation 2010-11



the 220KV, 132KV and 11KV networks. The power sector was managed by WAPDA headed by a Chairman and three Members: Power, Water and Finance. There were 12 Electricity Boards each headed by a Chief Engineer. In 1994, a National Power Plan (NPP) based on a least cost generation plan was developed for the 1995-2018 period which envisioned an energy mix of 42% hydro including Ghazi Barotha, Kalabagh, Basha, Kohala and Tarbela extension, and 32% thermal located mostly at sea coast using combined cycle technologies based on coal and indigenous gas. However, the end of the Cold War with the collapse of the Soviet Union in 1991 ushered a new era of neo-liberal global economic order with market economy and privatization as its key instruments. Thus rather than following the NPP, the 1994 Energy Policy instead followed the neo-liberal dictates of global capitalism instituting the following changes: one, no power plant was to be funded in the public sector; two, government organizations were to be privatized and a Privatization Commission was formed for this purpose; three, the persistent policy of generation and transmission planning based on least cost & other parameters was abandoned, and instead IPPs were invited to install power plants anywhere suited to them irrespective of consideration of fuel, technology or logistics; and lastly WAPDA was asked to unbundle into 14 companies with the objective of privatization. The result was that while Pakistan had a small reserve in 2000, the short fall increased overtime and by 2012 load shedding in terms of energy increased to 27.5% of the national demand.

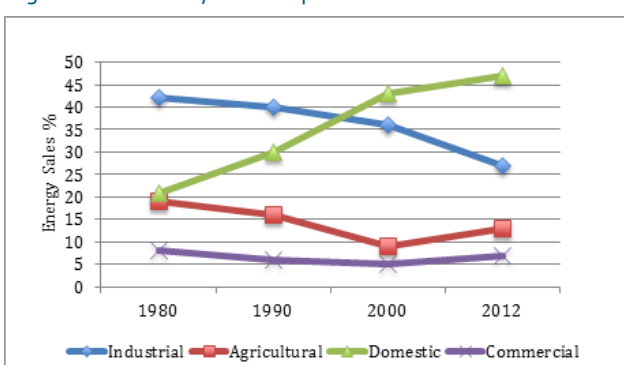
In discussing the evolution of energy mix, Zaidi argued that roots of the energy crises lay in our commitment to global capitalism as the same policies were followed irrespective of who was in power in Pakistan. Thus investment in bigger hydro power plants stopped as the public sector took a back seat while the private sector only came up with smaller projects which had comparatively higher generation costs and lower efficiency. HUBCO with 1,200 MW was the biggest plant set up while all others ranged from 200-400 MW. Over time, the hydel-thermal energy mix changed from 69:31 (1960), 45:55 (1990) to 35:65 (2010) and 30:70 (2013) while distribution of power generation changed to 48% private and 52% public. Additionally within thermal, the gas component in 2011 comprised of 25.43% while furnace oil was 34.53% as the

power sector did not get the needed gas owing to CNG usage in transport. Thus as the furnace oil component increased, so did fuel costs which led to higher electricity rates. The problem was further compounded because the productive aspect within the consumption pattern decreased with the increase in domestic component at the expense of industrial consumption.

> “...there was a severe lack of ownership and initiative in the sector as lack of tenure security led to indecisiveness at all levels affecting institutional stability.”

Zaidi then analyzed the restructuring of WAPDA which was unbundled into 14 companies in 1998 with the objective of privatization. The original Power wing was made the National Transmission and Despatch Company (NTDC) and given the 500KV and 220KV networks, while its Area Boards became ten independent distribution companies (DISCOs) each headed by a chief executive with a team of 7-8 general managers and chief engineers responsible for the 132KV and 11KV networks. Additionally three generation companies (GENCOs) were also created such that WAPDA was reduced to the handling of dams and water related energy issues only. Commenting on the new structure, he argued that to hide their lack of expertise, mismanagement and corruption a new term ‘administrative losses’ was coined. He stated that distribution and transmission losses could not technically be more than 10-11% and thus the rest had to be theft, mismanagement and corruption which was highest in Northern Sindh (45%) followed by Khyber Pakhtunkhwa (37.4%), Southern Sindh (32.4%) and FATA (21.6%).

Figure 2: Electricity Consumption Pattern



He suggested that the evolved institutional structure was at the core of power crises today specifying four areas. First, the biggest flaw was that the core technical departments like planning, design, protection and communication stayed back with NTDC and were not developed in the DISCOs. The DISCOs were also given the 132KV network which had always been planned, designed and managed by the department which was kept with NTDC leaving the DISCOs with no capacity to conduct simulation on the network they controlled. Additionally, without agreed governance rules, the DISCOs and NTDC were unclear about the situation in the other’s network leading to mismanagement. Second, while WAPDA had a simple structure whereby decision making authority and accountability lay with four people, now each of the fourteen companies had its own management leading to a top heavy management structure. For example, the Lahore Area Electricity Board earlier run by a Chief Engineer had now become LESCO with its own Chief Executive Officer (CEO), 4-5 General Managers, 8-10 Chief Engineers and a 15-16 member Board of Directors. Third, the set of rules that had been followed earlier by one entity were not properly set or managed through the rules of interaction for fourteen independent entities. For example, all power generation from IPPs, WAPDA, GENCOs, Small Power Plants (SPP)/Captive Power Plants (CPP) still went to one entity creating a single buyer market and a power pool called the CPPA, which distributed it to the DISCOs and KESC. Fourth, although all fourteen were private limited companies on paper, in actuality they were owned by the government, controlled by PEPCO and run by the Ministry of Water and Power through adhocism and stopgap arrangements with complete disregard for managerial aspects leading to poor governance of the power sector. For example, PEPCO sometimes stood dissolved with extra charge given to Managing Director (MD) NTDC. For the last four years, NTDC did not have a full time MD while Joint Secretary Water & Power held the additional charge of MD NTDC and PEPCO during the last two years. The Board of Directors (BoD) was constituted and dissolved in rapid intervals and it had no BoD for the last two months. DISCOs presented an even more anarchical situation as CEO LESCO had become a game of musical chairs since the last two years. Members of BoDs of all companies were political appointees with no or little merit for the position. Thus, there was a severe lack of ownership and

initiative in the sector as lack of tenure security led to indecisiveness at all levels affecting institutional stability. The Rental Power scandal while keeping the politicians unharmed had led to the prosecution of some power sector employees involved in paper work further harming the environment as many engineers now refused to touch new projects instead using delay tactics to avoid taking responsibility.

> “... provincialize DISCOs to resolve the theft problem by ensuring that provinces were responsible for bill collection under their law & order mandate.”

After providing an overview of the past and present, Zaidi presented options for the future by explaining the National Power System Extension Plan (NPSEP) prepared in 2011 by the NTDC updating the 1993 plan of which only Ghazi Barotha in hydro and Ucch Power Plant in thermal were implemented. Zaidi had participated in the preparation of both plans and stated that the 2011-30 plan was based on indigenous components with present situation as the base year. It envisioned a change in the energy mix to increase the hydro component from the current 28% to 37%, Thermal Coal from 1% to 34% while decreasing Thermal Gas from 31% to 11% and Thermal Oil from 37% to 6%. He argued that if this plan was implemented, Pakistan could cross the peak load by 2018 though it required huge investments of about $400B by 2030. But the government had yet to take any action on the plan. He suggested that underground coal was not a unique situation as it was being used by other countries primarily through mining. We just needed to decide if gasification or mining was the way forward. Nuclear energy initiative was being conducted through the collaboration of China and Pakistan Atomic Energy Commission. In renewable energy, wind power had been neglected because of a lack of knowledge and capacity owing to the lack of culture of taking risks on new things.

He further explored the bottlenecks in Public Private Partnership that restrict investment suggesting that while investors were coming in a big way, the institutional hurdles didn't facilitate them. The process of starting a new project included PC1 approval from the Planning Commission and ECNEC, procurement of land for sub-station, right of way for transmission line, arranging of funds from own sources or international donors, and an initiation of the process of transmission and interconnection schemes before actual construction could start. While the average

Table 2: Corruption & Administrative Losses July 2013

Companies	Units (MKWh)			Losses %age
	Received	Billed	Lost	
Lahore - LESCO	5,132	4,364	768	15.0%
Gujranwala - GEPCO	2,141	1,846	295	13.8%
Faisalabad - FESCO	3,070	2,644	426	13.9%
Islamabad - IESCO	2,665	2,370	295	11.1%
Multan - MEPCO	3,675	2,901	774	21.1%
Peshawar - PESCO	3,206	2,008	1,198	37.4%
Tribal - TESCO	473	371	102	21.6%
Hyderabad - HESCO	1,441	974	467	32.4%
Sukkur - SEPCO	1,452	799	653	45.0%
Quetta - QESCO	1,412	1,116	296	21.0%
Total DISCO	24,667	19,393	5,274	21.4%

time of 3-4 years given to private producers for connecting their power plant with the grid operator's transmission line was fine for thermal or hydro projects, it did not work out for solar and wind IPPs as their plant could be ready within 12-18 months. Additionally, the CPPA was not ready to start negotiation on energy purchase agreements till after the grid was available. As the IPPs required complete paper work to arrange funding which took 3-4 years owing to transmission connection, investment in renewable energy was locked up. Thus the wind corridor with the potential of 20,000 MW was stalled while the solar potential in Cholistan with proposed 500 MW or 1000 MW IPP plants was restricted as the current 66 KV line could only carry 30 MW while a 220 KV grid required 3-5 years to complete. Further, the small IPPs of less than 50 MW were knocking on various doors without success as the NTDC or CPPA's doors were closed to less than 50 MW plants according to the Energy Policy while the DISCOs argued that they did not have the capacity to write an EPA.

> "...the National Power System Extension Plan which had been developed recently through thorough study and simulations should be followed without delay."

The last part of Zaidi's presentation concentrated on policy recommendations. He emphatically argued for formulating an integrated and coordinated energy policy whereby initial planning was done centrally to ensure proper coordination between the various institutions while implementation was done in a decentralized way. Additionally, emphasis had to be on indigenous resources and the public sector needed to focus on mega projects, otherwise the current crisis would be curtailed in the short run only to appear again in the future. He specifically critiqued the direction taken by Chief Minister Punjab who had asked WAPDA to suggest five locations for 1,000 MW coal based plants in Punjab, convert existing oil based plants to coal and establish 50 MW coal based plants at Lahore, Faisalabad and other cities, all based on imported coal. He pointed out three issues with this plan; one, the needed infrastructure was not available due to a lack of special bogies for transportation of coal, railway tracks and the capacity of Karachi port to import so much coal; two, coal was increasingly becoming expensive in the world market and thus a long term perspective was needed to ensure that another CNG scenario was not repeated; three, there were environmental hazards of establishing coal based plants near populated areas and instead, a better option would be to put up imported coal plants on the coast and have transmission lines bring electricity to the needed areas.

Delving into the changed scenario post 18th amendment

Table 3: NPSEP 2030 Power Generation Expansion Plan

	2010-11		2020-21		2029-30	
	(MW)	(%)	(MW)	(%)	(MW)	(%)
Hydro	6,555	28%	17,590	30%	41,546	37%
Thermal–gas	7,200	31%	11,242	19%	12,015	11%
Thermal–oil	8,471	37%	7,056	12%	6,855	6%
Thermal–coal	150	1%	15,691	27%	37,774	34%
Bagass & Bio waste Plants	0	0%	100	0.20%	100	0.10%
Nuclear	803	3%	3,187	5%	6,947	6%
Wind	0	0%	1,800	3%	5,400	5%
Imports	0	0%	2,000	3%	2,000	2%
Total	23,179	100%	58,866	100%	112,639	100%

which gave provinces the right to setup energy plants, he stated that provinces still did not or have limited capacity as they could not ensure sovereign guarantee to international lenders. Giving the example of India where 50-60% power was handled by provinces through State Power Boards linked together through a National Grid Company, he argued that provinces needed to develop their own financial and institutional capacity. This included having own CPPA, Power Purchase Agency and a Power Development Board to manage the electricity produced and distributed in the province while inter-state power purchase was handled by the Council of Common Interest. This further required abolishing PEPCO and provincializing DISCOs to resolve the theft problem by ensuring that provinces were responsible for bill collection under their law & order mandate. He further argued that the rules of free market economy should be applied to DISCOs, who should directly buy power from IPPs while only paying NTDC for transmission of power.

Lastly, Zaidi tied the success of energy policy to management of internal and external politics suggesting its importance by providing examples of Kalabagh dam, the Diamer-Bhasha project whose foundation stone had been laid four times in the last 10 years without any progress, and the cancelled 900 MW Chashma nuclear plant agreement between Z. A. Bhutto and France. He further presented four possible projects with international implications: one, the Iran Pakistan Gas Pipeline whose future was uncertain; two, import of 1,000 MW power from Iran whose detailed feasibility study including the nut and bolt of transmission line was ready along with a commitment from Iran to accept barter trade of gas against wheat and rice; three, a 2,000 MW import of power from Central Asia - South Asia (CASA) intertie was lingering for years; four, a plan assessed in the 2006-7 NESPAK study to interconnect the grids of Economic Cooperation Countries (ECO) could free all 10 countries from international hegemony even without new generation as their peak times were different along with varied generation mechanisms but no progress had been made on this front. In conclusion, he made his overall recommendations: one, the National Power System Extension Plan (NPSEP) which had been developed recently through thorough study and simulations should be followed without delay; two, concentration should be paid to indigenous coal and gas while imported oil use for any future power plant should be declared a criminal offense; three, financial mismanagement should be addressed and structural reforms of the power sector should be carried out on an urgent basis; four, NTDC and DISCOs should enhance their capacity to improve partnership with IPPs; five, public and private sectors should pool all renewable and indigenous resources on hydel, coal, solar and wastes (urban, rural, industrial and agricultural); six, government should invite investment on big thermal plant sites identified in NPSEP; seven, initiate regional cooperation to facilitate import of power from Iran, Central Asia and India without buckling under international pressure. He closed with a rhetorical question giving the example of Ethiopia which was constructing a 5,000 MW hydropower project costing $4.8B with little help from China but mainly through funds generated internally from her own people rather than international loans. He asked if Ethiopia, a poor country could do it, why couldn't we?

> “...NTDC or CPPA's doors were closed to less than 50 MW plants according to the Energy Policy while the DISCOs argued that they did not have the capacity to write an EPA.”

:Mr. Abid Latif Lodhi currently working as the Financial Management Team Lead for Power Distribution Program and earlier for LESCO, NTDC, integrated WAPDA, NEPRA and Multi utility company of Saudi Arabia in various capacities as head of finance and regulations, gave an interview concentrating on the "Regulatory Framework of the Power Sector" to the CPPG Energy team on July 19, 2013.

Lodhi began by framing the context of his presentation suggesting that if energy was viewed as a commodity with a market comprising of buyers and sellers, the focus would automatically shift to understanding the market dynamics and raise a number of questions. Was the market segmented or integrated? What were its needs and whether the commodity supply chain comprising of generation, transmission and distribution systems was fulfilling those needs? Did the market have the propensity to pay for its energy needs and how did market consumers influence the policy through their elected representatives, the policy makers? Was there a regulatory framework for the supply chain and whether the players of the supply chain complied with the respective legal framework?

> "...every DISCO should have a different tariff according to its market, performance, power purchase cost, distribution margin and other factors."

He stated that Pakistan's power market was regulated under The Regulation of Generation, Transmission and Distribution of Electric Power Act 1997 commonly known as the NEPRA Act 1997. According to this Act, the National Electric Power Regulatory Authority (NEPRA) was established to regulate the power market of the country comprising of three segments - generation, transmission and distribution, each with its own license requirements and service territory. Thus following the unbundling of WAPDA, NEPRA acted as the main market regulator whereby all market issues and participation of various stakeholders including the government was determined according to the legal framework defined by the NEPRA Act 1997.

The transmission segment of the 1997 Act defined the concept of a national grid company through the national grid license with the role of Transmission Network Operator, System Operator, Market Operator and lastly Contract Registrar and Power Acquisition Administrator. This became the National Transmission and Despatch Company (NTDC) whose transmission license envisioned the power market structure, specifically the transmission of power from the generation system to distribution companies according to three phases. The pre 2004 phase was to have a Single Buyer concept, in which only the Central Power Purchasing Authority (CPPA) under NTDC could buy power for the shared power pool and supply it to the DISCOs. The 2004 to 2009 period extended more independence to the DISCOs through the concept of Single Buyer Plus in which CPPA had a smaller role while the DISCOs could begin to make bi-lateral contracts with generators for their energy needs. From 2009 onwards, DISCOs were envisioned as competitive entities, assessing their energy needs and fulfilling them through the power pool or supply contracts with generators. Thus every DISCO would be run as a profitable business only paying for the energy it needed at rates it negotiated. He suggested that the thinking behind these phases was the recognition that DISCOs did not have the capacity to make their own contracts with generators at the time of WAPDA's unbundling. Thus a transition period was provided whereby CPPA would manage power purchasing till the DISCOs developed their own capacity to make independent contracts. However, DISCOs had yet to develop their capacity to engage in competitive bidding to meet their market demand and still worked within the CPPA Single Buyer pre-2004 framework.

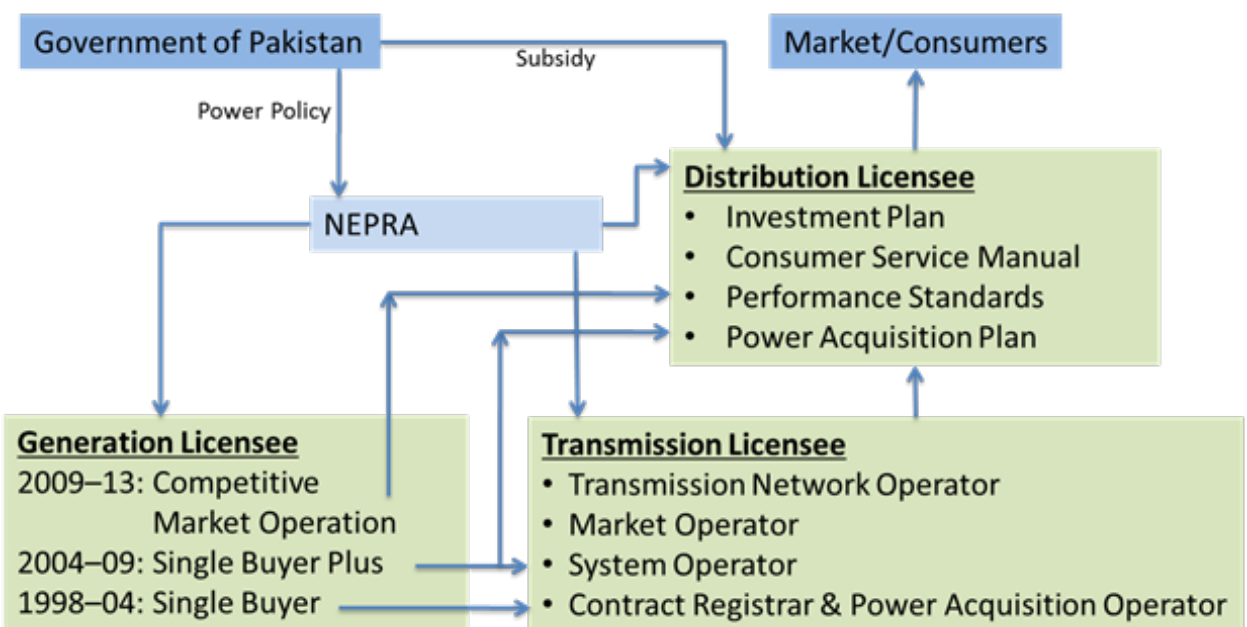
For DISCOs, the distribution license defined by the 1997 Act indicated the required distribution functions. They had a direct link with the market with the responsibility to fulfill the contractual obligations of providing electricity to their customers by getting the supply from power generators. They were to develop both their infrastructure and manpower to make a transition from Single Buyer to competitive bidding. They were to provide a power acquisition request every year indicating their power needs for next year, which NEPRA could use to estimate the overall electricity demand for the country. This required detailed knowledge of their service territory along with devising a master plan for territory expansion inclusive of network

expansion and demand increase. DISCOs were to adhere to certain service standards such that the voltage would not fluctuate more than ±5%, frequency would remain stable and load shedding criteria be defined in case of shortfall. Further, the consumer service manual provided the customer service protocols on how to deal with complaints, provide support and deal with new customers who needed electricity connections. But the DISCOs had failed to service the market according to the distribution license. The top level management of many DISCOs did not have the capacity to even draft a power acquisition request primarily because they could not forecast the demand for next year. Their performance standards were to be checked annually by NEPRA, which had not done so leading to their lack of development and uneven supply. DISCOs had yet to develop the concept of customer services as no proper training on customer dealings had been provided to the staff while bribes for new meters or wire fixing was common.

Lodhi thus argued that DISCOs did not follow the basic business principles needed to make an organization profitable. Instead, the evidence suggested that these companies were run like a department waiting for their energy supply and orders while doing nothing to fulfill licensed obligations towards their customers. He suggested that little had changed from when they were an Area Board, a department in the vertically integrated WAPDA following orders while planning and policy was done by WAPDA. These unbundled companies were not provided the necessary capacity to run on their own as the staff still lacked the very thinking, attitude and capacity required to run a profitable business. These instead comprised of executers, not planners or leaders who understood the business or the market they were serving. For example, the technical officers were mostly engineers who claimed to have more than 30 years of experience as a distribution engineer. But actually their experience could not be stretched beyond a couple of years because they had only been replicating basic operational tasks such as installation of connections, disconnecting the same, meter reading, bill distribution and installation of low tension wires/poles in most of their jobs as were done in an Area Electricity Board under the unified WAPDA. Whereas all policies and decisions came from WAPDA house. The irony was that the Chief Executive Officer of a billion dollar DISCO was appointed from amongst these engineers who neither had proper management and financial skills nor the necessary equivalent experience.

He disagreed that there was any difference between the various DISCOs even though they had vastly different losses arguing that the difference was only because they catered to different markets. For example, the Lahore

Figure 1: Power Sector Regulatory Framework



market was better than Peshawar in terms of propensity to pay, and law and order leading to a better recovery rate instead of a difference between LESCO and PESCO staff. Thus, a management swap between LESCO and PESCO would not make any difference in the workings of respective companies.

> From 2009 onwards, DISCOs were envisioned as competitive entities, assessing their energy needs and fulfilling them through the power pool or supply contracts with generators.

Further discussing the legal framework, it was stated that WAPDA was formed under the WAPDA Act 1958, whereas for the regulation of power related functions, guidance was sought from the Electricity Act of 1910 made by the British. Under the Constitution of Pakistan, 1973, electricity was in the concurrent list (before the 18th amendment) and thus both the federation and provinces could make laws regarding electricity. Thereafter the NEPRA Act 1997 was enacted by the federal Government. He argued that after the 18th amendment, electricity was purely in the federal domain. However, a constitutional guarantee under article 157 of the constitution allowed provinces to generate their own electricity (there is no 50 MW cap), procure power from the federation, set up their own transmission network and determine their own tariff though there existed some ambiguity in the selling of power. But this constitutional clause had yet to be used by any of the provinces.

Further discussing decentralization, he stated that actually every DISCO should have a different tariff according to its market, performance, power purchase cost, distribution margin and other factors. But the tariff only became applicable after the Federal Government's notification of NEPRA's determined tariff. When the Federal Government observed huge tariff differences between provinces, it instead notified an average tariff applicable to all DISCOs disregarding the NEPRA determined tariff. Given that the notified tariff was much lower than the actual tariff, the government paid the difference to the DISCOs as a subsidy. Thus Rs. 8.87 per unit was passed to the consumer while the actual cost was Rs. 14.66 leading to a hefty subsidy of Rs. 5.79 per unit. Additionally, the DISCOs never fully recovered the dues owing to about 20-30% theft or technical losses while keeping whatever subsidy they received from the government. Thus DISCOs could not pay the due share to NTDC, which instead took out its own margin and paid the rest to the generators, who were unable to meet their payments to the oil and gas companies or interest on their loans. The generation companies either took out more loans to keep the generation running or limited generation waiting for the state to pay off its existing debt. In brief, Circular Debt was a consequence of the inefficiencies of the power sector and delays in determination of tariff of distribution companies by NEPRA. Reforms in the sector had not been well thought out or followed properly. Either the legal framework needed to be followed or changed as it did not currently address the issues of the sector. An important reason for this was the lack of institutional memory in NEPRA as members who had originally designed the legal framework had retired while the new leadership had no understanding of the framework's provisions. He argued for professional management and technical staffing stating that this issue was at the very heart of state mismanagement as most institutions were run by a generalist bureaucracy with regular transfers leading to a lack of institutional memory and proper planning.

> These unbundled companies were not provided the necessary capacity to run on their own as the staff still lacked the very thinking, attitude and capacity required to run a profitable business.

:Munawar B. Ahmad, CEO of EMR Consult, an Energy and Management Resource group who had formerly served as Managing Director & CEO of Pakistan Electric Power Company (PEPCO) and Managing Director Sui Southern Gas Company Limited (SSGC), was invited to deliver a talk on "Testing Times for Pakistan's Energy Sector" on February 9, 2012.

Ahmad opened his remarks by stating that energy was the life line of economic and social development of a nation. But in Pakistan's case, energy sector suffered from poor policy, mismanagement and non-implementation of projects leading Pakistan to be ranked in the acute energy starved economies with per capita energy consumption among the lowest group in the world at 15 mbtu as compared to 104 for Malaysia, 54 for China and 21 for Indonesia. He stated that Pakistan should aim to double its energy consumption per capita to 30 mbtu in the next twenty years. But its current consumption pattern also required changes as in comparison to Korea whose Industrial sector used 46% electricity as compared to 26% for Domestic, the usage of electricity was opposite in Pakistan leading to high usage for a sector which did not produce GDP. Additionally in gas consumption, the General Industries got about 26.1% which was not enough while the Transport CNG sector got 7.7%. Based only on pipeline quality gas, CNG share actually constituted 13% and was highly subsidized at 1/3 the cost of gasoline, which only benefitted the rich and upper middle classes.

He then proceeded to outline the impact of energy crises stating that the availability of power for the industrial sector was seriously constrained preventing the production of value goods and services. The job losses were in millions, loss of exports was about $2B and the total GDP loss stood at Rs. 300B. But the current government had not addressed the energy issue. No major oil, gas or power generation project had been formulated in the past four years for completion in the 2012-15 period while the accumulated Circular Debt of Rs. 651B in the last five years had further aggravated the problem. Thus the current electric power shortage of 4,000-6,000 MW and the natural gas shortage of 800 mmcfd in the summer and 1500 mmcfd in the winter were expected to rise.

He then delineated eight distinct causes of the current energy crisis. One, a lack of integrated energy planning as the Petroleum Institute of Pakistan (PIP) had showed a need for revised projections for planners of power sector and oil and gas industry. Demand projections of gas compromising 49% of the primary energy mix assumed that transnational pipelines would be built without consideration of import modalities and costs. He instead thought that the likelihood of implementation of transnational pipeline projects on time was minimal because of technical and political reasons. Similarly, demand projection of 22.63 million tons of oil equivalent (MTOE) oil imports approximately costing $30B was unaffordable and thus unattainable. The demand projection based on 6.5% GDP growth rate was also unrealistic as no emphasis was given to the supply side, thus underplaying gap coverage through coal, hydel, nuclear and the alternate energy sources. Two, the imbalanced primary energy mix with 49% dependence on gas and 32% on oil, POL and LPG was unsustainable. The projected natural gas dependence of 48% in 2020 was unattainable because of the continuing delay of transnational pipelines (TNPs) and Liquid Natural Gas (LNG) import projects. Of the 32% oil, about 82% was imported. The rising cost of oil currently at $110 per barrel made Pakistan's 41% oil based thermal generation unsustainable and was a major reason behind the existing energy sector debt of $7B. The fuel oil import bill was $12B in 2010-2011 and was projected to rise to $30B (oil at $100 a barrel) by 2015 and $50B in 2020. Instead, Pakistan's electricity generation from coal was 0.1% compared to 76% for China, 68% for India, 40% for Germany and 51% for USA.

Three, non-utilization of vast indigenous primary energy resources such as the Thar coal mine which was the

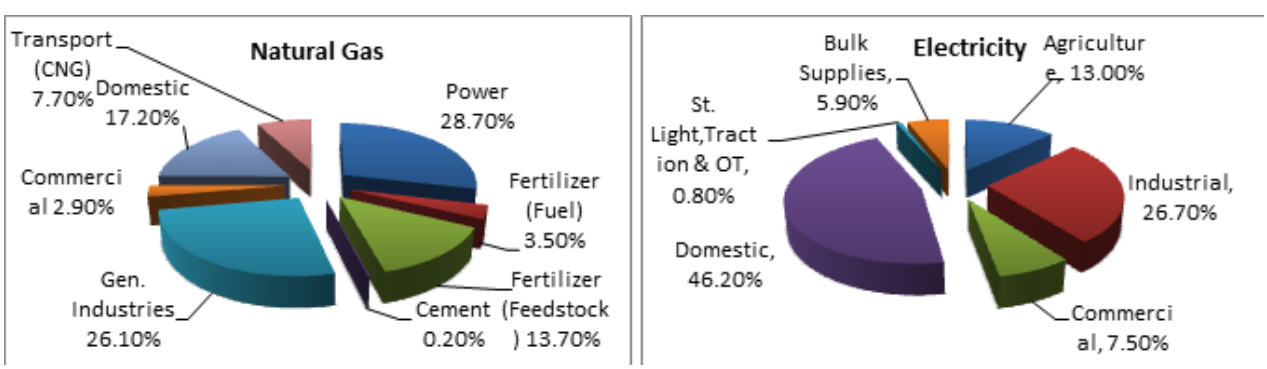
world's single largest contiguous coal mine supporting Pakistan's claim of 16% of the world's total coal reserves. It was equivalent to 480B barrels of oil worth $25 trillion which was more than the combined Iran-Iraq oil reserves to date. However, it remained unutilized due to flawed policy and ineffective development strategies. Four, theft, losses, mismanagement and corruption were significant issues with theft alone equaling Rs. 100B a year for the Power sector and Rs. 25B for gas utilities. Additionally, nonpayment by government organizations amounted to another Rs. 85 billion a year. Five, lack of effective project structuring, planning, financing and non implementation of indentified viable projects. Though a few projects had been much talked about but it was unlikely that they would actually happen because their project development had not been done correctly. Six, mismanagement and political interference were well documented and covered. Seven, a disorientated regulatory framework as both Oil and Gas Regulatory Authority (OGRA) and National Electric Power Regulatory Authority (NEPRA) didn't follow their respective objectives or had the needed organizational independence. While they were supposed to be under the Cabinet Division, in reality they were controlled by the Ministries of Water & Power, and the Ministry of Petroleum. Eight, the non-implementation of Pakistan's first Integrated Energy Plan 2005-30 which was prepared by the Energy Plan Committee comprising of 30 stakeholders in December 2004, and was based on projected GDP growth rate of 6.5%. According to the plan, a clear road map had been defined to fill the gap between demand and indigenous supplies through gas imports and oil. He argued that had this plan been followed, there would be little or no gas or power load shedding today.

Ahmad considered Circular Debt to be the most crucial issue at hand. Explaining debt management, he provided the 2009 example when Rs. 301B was transferred to Power Holding Company Limited (PHCL) under the Ministry of Water & Power. While this cleared the balance sheets of power sector companies, the repayment plan required annual payments of Rs. 50B from the budget for the next 15 years. However, an additional debt of Rs. 180B had already been accrued and was currently parked in the oil and gas sector entities PSO, OGDC, SSGC, SNGPL, PPL and the like, while an additional Rs. 163B was parked with the IPPs under their own credit lines due to non-payment by PEPCO/Central Power Purchasing Agency (CPPA). He argued that taking money from one deep pocket and putting it in another while both were owned by the government did not resolve the Circular Debt issue and instead the following six fundamental issues needed to be addressed:

> "...proposed a national energy authority to ensure centralized, coordinated and integrated planning."

one, higher overall generation costs as indigenous resources had not been developed, and due to the lack of gas, a number of generation plants had to use more expensive fuels; two, irrational tariff structure resulting in a tariff gap of about Rs. 2/kwh leading to a monthly deficit of Rs. 20B; three, massive losses amounting to 25% in the WAPDA/PEPCO system with theft equaling Rs. 100B per year due to political patronage and mafias; four, non-pay-

Figure 1: Energy Consumption By Sector 2009-10



ment by Karachi Electric Supply Company (KESC) to Sui Southern Gas Company (SSGC) which had now reached Rs. 46B and to PEPCO/CPPA of Rs. 50B; five, non-payment of power by federal and provincial governments amounting to Rs. 10B a year and by the private sector another Rs. 10B; six, non-payment of power used by FATA, Khyber Pakhtoonkhwa and Baluchistan of Rs. 10B each year, Sindh of Rs. 15B, and Azad Jammu and Kashmir of Rs. 5B amounting to a total nonpayment of Rs. 50B a year.

Table 1: Competing Fuel Costs in Relation to Local Pipeline Gas

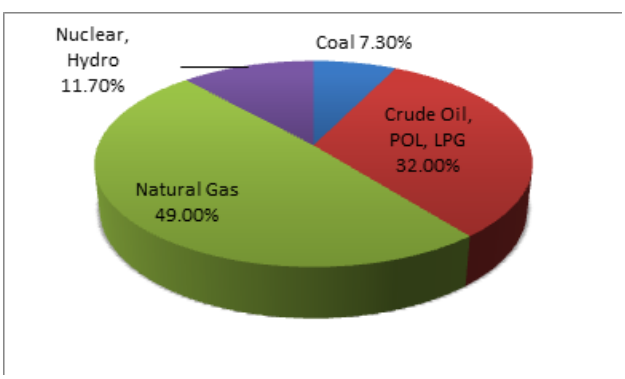
Industrial Tariff as on February 2012			
Fuel/Unit of Measure	Price/mmbtu		
	Rupees	Dollar	Ratio
Gas/mmbtu (local pipeline gas)	507.00	5.60	1.00
Gasoline (MOGAS)/Liter	2881.47	31.80	5.68
Diesel (HSD)/Liter	2806.87	30.98	5.54
Kerosene/Liter	2700.79	29.81	5.33
LPG/KG	2978.10	32.87	5.87
HSFO	2083.80	23.00	3.98
CNG/KG	1583.58	17.48	3.12
LNG 14% of Brent + Storage, Re-gas, Import and PQA charge, Transportation cost, GST & Withholding tax/mmbtu	2019.47	22.29	3.97

To stop the above listed perpetual bleeding, he suggested strong political will and coercive measures as part of a multi-pronged strategy to address and resolve the fundamental issue rather than repeated power tariff increases dictated by the World Bank and IMF.

Discussing future outlook, Ahmad disagreed with the projections of PIP arguing that the numbers on gas and oil imports did not take into account fulfillment modalities requiring an alternative plan. For example, the planned completion of infrastructure especially transnational pipelines was unlikely before 2020. Similarly, the affordability of projected cost of 5.2 bcfd mmcfd gas imports by 2022 estimated at $100B a year was questionable.

Concluding, he articulated that the solution to Pakistan's energy crisis centered on a revised and balanced primary energy mix which required a shift to power generation plan based on available indigenous primary energy including Thar coal and hydel. A fast track development of alternate energy including wind, solar and biomass was also needed. Further proposing an energy gap coverage strategy for 2030, Ahmad asserted a complete implementation of hydel, coal, nuclear and alternate energy projects through a phased program till 2030: firstly, Thar coal utilization through gasification and co-production plants could produce 25,000 MW of electricity increasing its share to 25% of the power generation mix and 30% of the primary energy mix; secondly, hydroelectricity could produce 32,200 MW of electricity increasing its share from 11% to 20% by setting up small and medium hydel units on canals and Run of the River plants of up to 8,000 MW capacity, and four large hydel power dams with a capacity of 17,600 MW (Bunji – 5,400 MW, Dasu – 3,800 MW, Pattan – 3,800 MW, Bhasha – 4,600 MW, Kalabagh – 3,800 MW); thirdly, alternate energy projects should be facilitated with the aim of increasing its share to 5% of the primary energy mix; fourthly, the share of nuclear energy could be increased to 7% as Pakistan had the required technology, knowledge and fuel for it. His final remarks propounded the need for a vigorous effort by engineers and professionals to formulate and implement a comprehensive National Energy Plan to ensure energy sufficiency, sustainability and sovereignty for Pakistan in the 21st century.

Figure 2: Pakistan's Primary Energy Mix



The talk evoked a number of questions from the participants. Responding to a question regarding the responsibility of engineers and professionals in the energy crisis,

Ahmad argued that more than technical, it was a political issue. He emphatically put the onus on political interference and its requirements of commissions and kickbacks as the main hindrance in resolving the energy crises stating that if the state were to do nothing but rely on competent professionals, the job could be done.

> “...need strong political will and coercive measures as part of a multi-pronged strategy to address and resolve the fundamental issue rather than repeated power tariff increases dictated by the World Bank and IMF.”

In response to a question regarding the policy and institutional framework for improved planning and project development, Ahmad argued that while demand side forecasting was stressed, the supply side focusing on energy resources provision was conspicuously absent from planning in Pakistan. He thus proposed a national energy authority to ensure centralized, coordinated and integrated planning. Discussing power sector reforms and PEPCO, he agreed with the reform structure but stated that it was not implemented correctly. PEPCO was strictly a management company for integrated planning and should stick to that role.

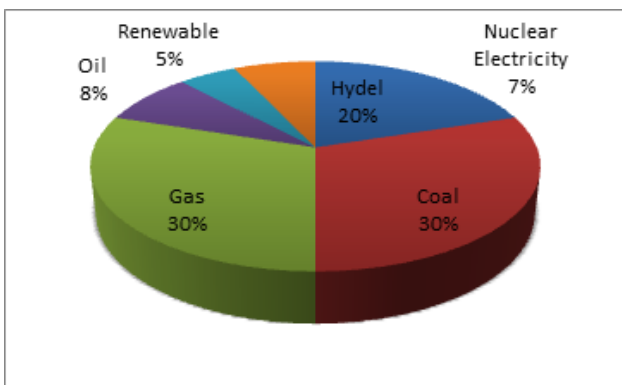
Table 2: Estimate of Sources of Energy Sector Circular Debt of Rs 275 billion

Sector/Reason	Annual Deficit (Rs. Billions)
Subsidies due to irrational Gas Tariff slabs	15
Subsidies due to irrational power tariff slabs	25
Theft (Power)	100
Theft (Gas)	25
Non-Payment by KESC	30
Non-Payment by Provinces, AJK, FATA	50
Non-Payment by Government Departments and Private Sector	20
Total	275

Answering a question regarding reasons for non-utilization of coal reserves, Ahmad stated that it was a technical issue owing to a dearth of mining engineering knowledge in Pakistan and in depth understanding of the resource.

Dr. Farid Malik, Professor of Management at Forman Christian College and a mining engineer by qualification pointed to mining's provincial status as a reason for the lack of knowledge. Further exploring the subject, Malik suggested that three proposals were tabled for Thar coal in 2009: underground coal gasification, Engro's coal mining project and lastly a test mine. While all these proposals were accepted by the planning commission, investment was directed only to the underground coal gasification project which claimed gas production in a short 6 month period. However this project had yet to borne fruit.

Figure 3: Primary Energy Mix for Proposed Plan



:Mr. Salman Khalid, emerging markets investment professional and academic, and Mr. Mohammad Jahanzeb Khan, Secretary Energy Government of Punjab were invited by the CPPG to deliver a talk on "Power Politics in Pakistan: Past Mistakes and the Way Forward for Energy Security" on November 2, 2012.

Salman Khalid opened the talk with the statement that there were a lot of misperceptions about the energy sector and a solution could only be articulated after the right diagnosis had been made. The debate had mainly revolved around governance issues that the state could not regulate or govern properly. The spike in oil prices had led to an overall inflationary pressure on all prices including power. The state could not manage the Circular Debt owed mainly to power plants, which then had no money to buy fuel and thus operated below capacity leading to excessive load shedding. While people perceived these as the causes behind the energy conundrum, Khalid preferred to call them outcomes of the real problem. Instead, he argued that the root lay in the 1994 Energy Policy and the way power sector was restructured and privatized.

> "...the policy was blind to the fuel used as well as to the efficiency of the plant..."

Khalid followed with a detailed assessment of the 1994 Energy Policy calling it Pakistan's first private sector energy policy. He stated that the policy was based on the HUBCO deal which was a 1,292 MW, $1.6B project. It had been hailed as the "Deal of the Decade" by Euromoney Institutional Investor magazine and "The best energy policy in the whole world" by the then US Energy Secretary Hazel O' Leary. The World Bank claimed that the shift from public to private sector would deliver wider, better and more reliable service, and improve the government's fiscal position freeing up public funds for important causes such as health and education. The argument was that state subsidies were not helping the poor since most were not connected to the grid in any case and thus taking away these subsidies would actually hurt the rich more than the poor.

> "...according to the 1994 Energy Policy, it was the public sector subsidizing the private sector."

Earlier, Wapda and the state used to borrow from various sources to run its power plants and Wapda managed the generation, transmission and distribution functions. The new deal separated generation from transmission and distribution with private investors offering a tariff for the sale of electricity to the still state owned transmission and distribution companies; investors were guaranteed a US dollar based internal rate of return of 15–18% over a 25–30 year period of the power purchase agreement after coverage of operational costs, backed by the Government of Pakistan; the allowance for 80:20 debt equity ratio meant that investors could invest only 20% of the total cost while borrowing 80% from the banks; new plants were exempted from corporate income tax, customs duties, sales tax, and other surcharges on imported equipment. The deal was too sweet as according to the terms and conditions, the government was liable to pay both for the Capacity Payment – the fixed costs of the power plant including debt and equity payments, and Energy Payment – the variable costs based on production, with the state guaranteeing an IRR of 15-18%; the policy was blind to the fuel used as well as to the efficiency of the plant leading to even inefficient single cycle plants coming online while all opted for oil or gas based plants as they were the easiest to set up; all payments were indexed to USD subject to fluctuations in the exchange rate while inflationary risk was borne by the state; and Wapda was contractually liable to pay the IPPs' debt inclusive of interest payments

whether or not they generated any electricity. Thus a gold rush started with 20 IPPs installing a combined capacity of 4,500 MW when predicted short fall was only 1,500 MW leading to over capacity for a decade while the state paid for electricity that was not being used.

The fall out of the policy was apparent after a decade as the energy mix of the electricity generation power plants changed from 70% hydel and 30% thermal in 1990 to the opposite 70% thermal and 30% hydel today. Considering that the average cost for thermal is 16-18 cents/KWH and for hydel is 3-4 cents/KWH, electricity became more expensive with tariffs increasing 530% in rupee terms for the average consumer. The price elastic industry ground to a halt while the state extended a subsidy usually by printing money to partially take on the burden of the consumer. Thus the policy rather than freeing investment for health and education actually hurt the state's fiscal position while increasing electricity prices and higher inflation hurt the very poor in whose name the policy was inculcated.

Table 1: Cost Comparison of Thermal Plant Costing $100 million at 25:75 Equity Debt Ratio

	Public Sector	Private Sector
Debt Financing (over 10 years)	@12% = $45m	@15% = $56m
Equity Return	0	@15% = ~$4m per annum = ~$97m over 25yrs

Further analyzing the crux of the policy which supported private sector investment over public sector in generation, he argued that for every $25 million in private equity, the state ended up paying $83 million extra (97m in equity return +11m difference in debt financing – 25m in private equity) over the life of project or US $22 million if discounted at 7.8%. Thus according to the 1994 Energy Policy, it was the public sector subsidizing the private sector. While proponents of the 1994 policy had made an argument based on rampant corruption and inefficiency of public sector power generation companies (GENCO) leading to high costs as compared to the IPPs, this comparison was misplaced as it did not consider that most GENCOs functioned on obsolete technology, had outlived their life and they had not been regularly upgraded since being setup in the 1960s and 70s. Compared to them, the IPPs were introduced in the 1990s and thus had considerable shelf life as compared to the GENCOs.

Table 2: Cost of Electricity

Type	US Cents/KWH
Generation + Transmission	8.0
Transmission Losses + Distribution Losses + Theft + Non Payment	1.5
Distribution margin and others	1.0
Cost of providing electricity to end user	~ 11

Khalid followed the 1994 Energy Policy analysis with future outlook. He first described the current market structure of the power sector stating that the current average domestic tariff of 11cents/KWH was about the same as the cost of electricity while the industrial tariff was slightly cheaper at 9 cents/KHW. However, with high generation costs, the future outlook did not look too good as the current oil price of $100/barrel was bound to increase as world economy moved out of recession. Additionally given the country's high risk profile, private investors would ask for higher returns. The state could either comply with such demands and further jack up the cost of power generation or generate cheaper electricity through the public sector as the goal either of increasing competitiveness or lowering costs through private sector had not been met. This was primarily because the state was providing a guaranteed Cost + Return to the private sector which left no incentive to improve efficiency through more efficient power plants or fuel sources. Thus the Cost + Return model needed to be revisited for any future private sector investment. More importantly, rather than exposing ourselves to risks by relying overwhelmingly on imported fuel and foreign investors, the government should focus on exploiting indigenous resources as there was no solution till the energy costs were brought down because the lack of propensity to pay at the current rate actually led to Circular Debt. For example, less than 59% of the plants' existing capacity was being utilized up till 2011 leading to a short fall of 4,000-5,000 MW. However, if the government had funds to pay, the short fall could be

reduced to 500-1,000 MW which meant only a 1-2 hour load shedding.

In providing a brief overview of the gas sector, he stated that gas production in Pakistan was peaking in 2012-13 and will only go downhill from there unless new reserves were discovered. Instead, gas exploration companies were spending a major part of their income paying out dividends rather than finding new reserves. For example, OGDCL took out 30% and PPL 50% of its entire net income as dividend. Gas production was 4.2 mmcfd in 2012 while the constrained demand was around 6.2 mmcfd. While almost 50% of the total known reserves of 54 trillion cubic feet had been exhausted as of 2011-12, gas was still being sold to fertilizer plants at $0.75-1.20 per mmbtu, to consumers at $2 per mmbtu, and to power producers and CNG stations at a slightly higher price as compared to international price of LNG which stood at $18 per mmbtu. Thus the supply of CNG gas to the transportation sector only forced the poor to subsidize the rich through inflation while the state continued to sell gas it did not have at cheap prices.

In conclusion, Khalid argued that Pakistan must rethink and revise its energy mix as it did not have the money to continue funding high cost energy projects. He reiterated that most of our energy problems today stem from a flawed energy policy framework while governance issues only further aggravated the situation. Lastly, he articulated specific policy recommendations dividing them into the short, medium and long term. For the short term, he suggested: one, public sector should take a pro-active role in satisfying base load demand especially through hydel and coal; two, require all new IPPs to use indigenous resources for generation like coal and hydel; three, contract all new IPPs to a Hybrid Merchant Market model thereby inducing competition and optimizing fuel, technology and scale choices to ensure minimum production cost; and lastly, move away from fixed returns model to variable returns determined by the IPPs' efficiency with potentially a floor and ceiling till sufficient base load capacity comes online. For immediate steps by the government, he suggested: one, phase out CNG use in transportation except public transport; two, lay a 60 km pipeline to connect to existing infrastructure at Jalandhar, India for importation of cheap gas. This would not only help meet the demand for gas but also allow dual-fuel thermal plants to switch from oil to gas bringing down the cost of energy; three, rehabilitate power plants at Jamshoro, Muzaffargarh and Guddu to recapture 1,220 MW at one-fifth the cost of new installation; four, shift single cycle and older inefficient power plants to combined cycle to improve their efficiency, which would also cost a lot less than setting up new power plants; and lastly introduce stringent efficiency standards for household electrical equipment, lighting, irrigation pumps, etc. For example, the current irrigation pumps which have 18% efficiency could be replaced with those with 40% efficiency over the next 5-10 years conserving energy.

> "...the state was providing a guaranteed Cost + Return to the private sector which left no incentive to improve efficiency through more efficient power plants or fuel sources."

For the medium, 3-5 year term, investment in coal based thermal power plants which were cheaper to setup than the hydel power plants and more efficient than oil based plants, the small run of the river hydel projects, the Iran-Pakistan (IP) gas pipeline and an LNG terminal along with Karachi-Lahore pipeline was critical. He argued that Pakistan should take a stand on the IP pipeline as Turkey also imported gas from Iran. But if it was too much of a problem for the US, then Pakistan should ask the US to share Shale gas technology with Pakistan. Other initiatives should include initiation of smart metering and grids to reduce theft and optimization of energy consumption, full use of alternative energy including solar CSP, wind and nuclear, and lastly to refocus OGDCL and PPL on exploration rather than on paying out dividends.

> "...gas exploration companies were spending a major part of their income paying out dividends rather than finding new reserves."

However, a long term solution required large hydel reservoirs including Kalabagh Dam, full scale exploitation of Thar coal and Shale gas, the Turkmenistan Afghanistan

Pakistan India (TAPI) pipeline and lastly new discoveries of OGDCL and PPL. However, all these had question marks except Thar coal owing to domestic or international politics.

> “...contract all new IPPs to a Hybrid Merchant Market model thereby inducing competition and optimizing fuel, technology and scale choices to ensure minimum production cost.”

Secretary Jahanzeb Khan spoke next exploring the context in which the 1994 policy framers worked. He argued that there had been a gradual paradigm shift from public sector being a provider of public services and goods to being a purchaser of public services and goods over the last two decades led by international organizations. Further, historically the federal government had not been effective in implementing power sector projects leading to huge cost over runs and time delays, and additionally the government lacked funds to start new projects owing to a low tax to GDP ratio. However, it was encouraging to hear arguments reposing faith in the public sector as a provider of public goods. In the context of power policy in Punjab, he stated that electricity remained more or less a federal subject even though the 18thamendment had given increased rights to provinces. The issue of whether provinces should take on power plants remained a divided issue as thermal power plants were located in the south and hydel plants producing cheap power were in the north. Thus given that devolution would have repercussions for all provinces, the constitutional position needed to be reviewed and misconceptions resolved through the Council of Common Interest, which had representation from all provinces. Lastly, he suggested that the Punjab government had established a department to focus on the development of more power plants as the 18th Amendment had greatly empowered provinces to generate power by scrapping the size limit on power plants. He agreed that the public sector must take sole responsibility for hydel projects as the private sector did not have this capacity. However, the options were different for Punjab. For rural electrification, Punjab had been exploring solar and biogas projects, but tariff for solar energy still remained high and thus only biogas remained a viable option. Additionally, solid waste was another fuel option that the government would consider on a large scale as several industries were already generating power using this option.

Forthcoming Publications

A Study of Khai Mohalla: Towards a Social Protection Policy Framework for the Informal Sector

The study assesses the efficacy of current public policies ‘from below’ through consultation of local population in order to understand the relationship between urban policy and informal sector.

Reforming Pakistan’s Energy Sector: Energy Market, Institutional Framework and Governance Issues

The study analyzes the evolution of energy sector post WAPDA un-bundling focusing on regulatory reforms, planning and governance of the sector.

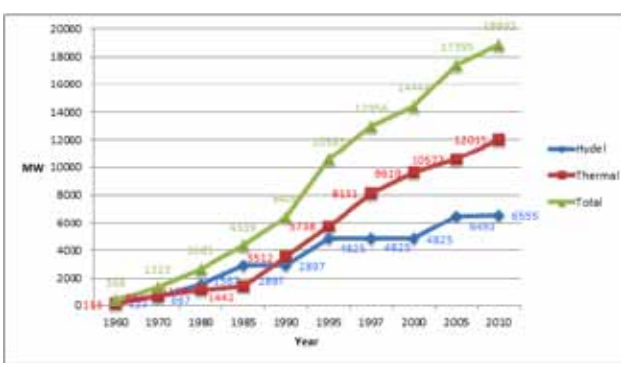
The Criminal Justice System as a Tool of Anti Terrorist Efforts in Punjab

The study explores two sets of questions: first, do anti-terrorism laws help in curbing terrorism and improving policing? second, what is the nature of relationship between police and the criminal justice system, particularly in Punjab?

:Engineer Hassan Jaffar Zaidi, CEO Power Planners International and Mr. Rab Nawaz, Secretary Energy Government of the Punjab were invited to deliver a talk on "Resolving Electricity Crisis in Pakistan: What Punjab Can Do?" at the Centre for Public Policy and Governance on October 27, 2011.

Zaidi outlined the structure of his talk to initially explore the roots of electricity crisis followed by options for Punjab to resolve the crises with reference to increased autonomy under the 18th amendment. In analyzing the basis of the energy crises, Zaidi concentrated on the supply-demand scenario, planning and governance. In terms of generation and consumption, he explained that the shift in energy mix from dominantly hydroelectric power to thermal power generation (imported oil, indigenous gas and other technologies) had gradually increased the cost of power in Pakistan and also made Pakistan dependent on international imports. The main problem though with thermal generation was the soaring oil prices as per unit kilo watt hour (KWH) cost had risen from 3.1 paisa's in 1971 to Rs. 7.5 in 2011. The change in consumption pattern added to the problems as the 21% domestic consumption versus 42% industrial in 1980 had now gone up to 42% domestic consumption instead shifting Pakistan from productive to a consumption based society. The total power demand of Pakistan in 2009-2010 was 17,000 MW which would increase to 24,000 MW in 2014-2015 and predictably to 90,000 MW out of which 62,000 MW would be demanded by Punjab in 2030.

Figure 1: Installed Hydel / Thermal Mix

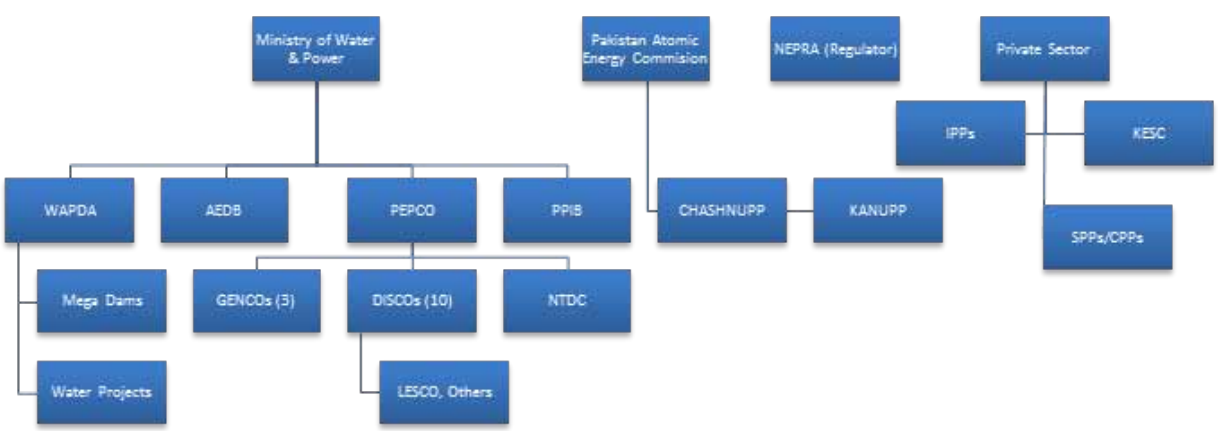


Discussing planning, Zaidi refuted the common perception and cliché that there was no planning regarding the power sector in Pakistan. He drew attention to the fact that a Least Cost Generation Plan (LCGP) was created with the help of experts and latest software in 1978. This was followed by a 20 year National Power Plan (NPP) prepared by WAPDA's planning department in 1994 with the help of Canadian International Development Agency (CIDA) over a 2-3 year period. However, the plan was not implemented and only two power plants identified in the 1994 plan were setup in the subsequent 20 year period. Additionally in 1994, the Pakistan Government changed its policy to bring the power sector under the free market economy conferring a major shock to the generation planning sector. Power generation was shifted to the private sector resulting in NPP being shelved the same year it was completed. Instead Independent Power Producers (IPPs) were invited to set up power plants at sites which suited them irrespective of those selected in the plan. Thus, while IPPs continued to set up smaller plants of max 200 MW, larger public sector power projects were put on hold or blocked even on natural locations along barrages. Only a 1,400 MW hydroelectric power plant at Ghazi Barotha, which began in 1993, was successfully completed in 2003. Explaining policy implementation breakdown, he said that the National Power System Extension Plan 2030 (NPSEP) also known as the NTDC Plan 2011 had suggested construction of two 500 MW thermal power plants at Nandipur and Chichokimaliyan to stem power shortages 2007 onwards. Interestingly, the same locations had already been identified in the National Power Plan 1994. While, initially both were stalled because of a controversy regarding construction in the public or private sector. Ultimately, Nandipur project was assigned to the public sector but the government could not arrange finances to complete it while the other power plant at Chichokimaliya never took off. Instead, the interim energy policy of 2009 allowed construction of an additional plant based on oil which again increased the cost of power generation.

Further exploring the governance structure, Zaidi highlighted the unbundling of WAPDA into 14 companies with the objective of privatization. The Ministry of Water and Power was the highest authority in the command structure of the power sector which exercised direct control over Water and Power Development Authority (WAPDA), Alternative Energy Development Board (AEDB), Pakistan Electric Power Company (PEPCO) and Private Power Investment Board (PPIB). The sector's supply chain worked such that power was generated by generation companies (GENCOs), IPPs, hydro power plants and nuclear power plants. The generated power went into the main national grid managed by the National Transmission and Despatch Company (NTDC) which was responsible for the transmission network, and also acted as the system and market operator, transmitting power to distribution companies (DISCOs). The DISCOs distributed power to the consumers, managed billing, collected the payments from consumers and paid NTDC which subsequently paid the GENCOs, who paid oil companies and other input providers. Any congestion in this cash flow system led to the accumulation of Circular Debt. Within this structure, WAPDA was only responsible for the larger dams and other water projects while PEPCO managed the GENCOs, NTDC and DISCOs. Zaidi argued that the new structure had led to bad coordination and disorganization as the newly formed private limited companies were not clear about their assigned roles and responsibilities. Though these companies had independent BoDs, they still followed directions from PEPCO. He instead suggested that the power sector should be devolved to the provinces to improve its performance.

Having reviewed and analyzed basic issues confronting the national power sector, Zaidi turned his attention towards Punjab. He stated that the Punjab Power Development Board (PPDB) and Punjab Power Development Company (PPDC) had made commendable efforts on small hydel plants having identified and issued 40 projects totaling 420 MW. The Punjab government was also encouraging coal based thermal plants to utilize coal fields in the salt range. Similarly three solar energy projects, two biogas and bagasse plants each and one solid waste plant were being executed. However, put together, these plants would generate 1,300 MW while Punjab's predicted demand by 2030 was 60,000 MW. Thus a lot still needed to be done at the provincial level especially since the 18th amendment had lifted the 50 MW power plant cap on provincial governments. He further mentioned that though a number of IPPs had already begun small hydel power plant construction on a number of identified irrigation system sites in Punjab, hurdles still existed as distribution companies lacked the technical expertise and capacity to provide connectivity to these plants. Providing recommendations to Punjab, he articulated that the recently made National Power System Extension Plan (NPSEP) had again identified power plant sites in Punjab at Haveli and Jhang of 3,000 MW each, and Sahiwal, Bhikki and Balloki of 1,400MW each. These sites were not owned by any generation company thus allowing Punjab government to initiate work on these sites. Additionally, some locations

Figure 2: Pakistan's Power Sector post WAPDA Unbundling



owned by GENCOs in Faisalabad, Lahore and Shahdara had outdated and low efficiency thermal plants which should be replaced by larger and more efficient plants. He further argued that for some projects, the sites had been identified, relevant analysis conducted and investors engaged but the bureaucratic system was still an impediment, which required the Punjab government to engage stakeholders including NEPRA and DISCOs to resolve existing issues and to develop consensus.

Zaidi however did not find Punjab government's efforts on renewable energy development as sufficient. For wind power plants, the Punjab government had only identified a few appropriate sites. Solar power generation also had a lot of untapped potential in Pakistan. Although it did not seem cost effective in the short run due to high capital costs, still it was much cheaper than oil based power in the long-run due to minimal operational & maintenance costs. Similarly, energy produced from waste was underutilized as Punjab produced great quantities of urban, industrial and agricultural waste. But a proper waste collection system and a proactive policy needed to be adopted in this regard.

> "Unless there was a principle decision on decentralization of the entire system similar to that of the Indian model, it would be very difficult for provinces to take any meaningful steps on their own."

He then proceeded to explain Punjab's place in the power generation landscape of the country. Given that Pakistan was a longitudinal country, sites for hydroelectricity were located up in the north while thermal plants were located in the southern regions. However, 70% of the demand was concentrated in Punjab which had limited resources for power generation. According to the most recent NPSEP power plan, sites on the upper Indus, its tributaries and Jhelum tributaries mostly located in Gilgit Baltistan were identified with potentially 36,000 MW of generation capacity, while the other 40,000 MW out of the total 100,000 MW plan was based on Thar coal. Thus, post 18th amendment, provincial harmony was vital for Punjab as it was dependent on other provinces for its electricity needs.

Lastly, Zaidi made recommendations to reform the institutional structure of the power sector. Reasoning that the current NTDC load shedding plan was proportionate to the level of electricity consumption rather than the distribution company's (DISCOs) performance leading DISCOs of Punjab to suffer excessive load shedding as compared to inefficient DISCOs, he suggested that DISCOs should directly purchase electricity from GENCOs and IPPs. NTDC should only be paid power transmission charges. PEPCO should be abolished and Central Power Purchase Agency (CPPA) should be devolved. Instead the Provincial Power Development Boards should be strengthened and empowered with the responsibility for electricity generated, sold, purchased and distributed in that province.

Secretary Energy, Rab Nawaz opened his remarks with a warning that the country was headed towards a deeper and a more serious crisis if steps were not taken to address pivotal issues on an urgent basis. The total cost of load shedding to Pakistan's economy was $1.5B per annum which was 2-3% of Pakistan's GDP. A total of 400,000 (formal sector) jobs were lost along with a loss in exports of $1B. He argued that rather than generation of electricity, its affordability was the real issue. Oil was not a viable option for energy generation as continuing with the existing energy mix and its reliance on oil, Pakistan's 2020 energy bill would include an $8B oil import bill solely for power generation. He argued that a champion was needed to clean up the mess created by strong vested interests involved in the sector.

Rab Nawaz challenged the view that big dams were the answer to Pakistan's energy needs (given agriculture was their primary focus and electricity but a convenient byproduct), instead he argued that WAPDA's policy had

totally neglected run of the river projects (RORP). He contended that the Indus and its tributaries were ideal for RORPs. He pointed out that India had set up 160 RORPs ranging from 5-200 MW on the three rivers of Indus, Jhelum and Chenab using its own resources and local experts generating about 7-8,000 MW. He stated that RORP was a more practical option for Pakistan as it followed an incremental approach and cost less, while a mega project required higher funding and thus assistance from the World Bank or Asian Development Bank. He was upfront in noting that the plans to set up numerous hydel plants in Gilgit Baltistan were impractical. It was beyond Pakistani laws and to extend NEPRA or WAPDA Act to Gilgit Baltistan meant amending the regulatory framework first. Privatization was successful only in perfect markets while Pakistani markets were imperfect. In that spirit, he critiqued the decision to unbundle WAPDA into 14 companies, observing that the decision was donor driven and did not take into account what suited the country's economic and political structure. No framework or mechanism was developed for the interaction of newly formed companies. Devoid of any accountability process in the system, there was little possibility for performance improvement. He advocated that Pakistan's system demanded robust public sector institutions which could be held accountable.

> "...energy produced from waste was under-utilized as Punjab produced great quantities of urban, industrial and agricultural waste."

In reply to Zaidi's suggestion that Punjab government should work on sites identified in the National Power Plan, he explained that all provincial government initiatives were circumscribed because Punjab did not have a transmission or distribution network of its own. Unless there was a principle decision on decentralization of the entire system similar to that of the Indian model, it would be very difficult for provinces to take any meaningful steps on their own. Further strengthening his argument, he agreed with Zaidi that inefficient DISCOs were being provided electricity at the cost of consumers who regularly paid their bills. Last month alone, 80% of the total collection of PEPCO was from Punjab which consumed only 60-63% of electricity. Thus, decentralization was important to improve the system. But he criticized the non-uniform privatization policy stating that only efficient DISCOs were being privatized while those unable to pay for electricity consumed were still under federal control. He additionally highlighted that the 700 MW being allocated to KESC, a privatized entity, free of cost should be checked. He also did not support NEPRA's existing role arguing that the institution created only hurdles, instead suggesting an alternative approach that announced upfront tariffs for each technology.

In terms of alternative options, Rab Nawaz suggested the use of biomass for fuel as Punjab had an annual surplus of 45 million tons of biomass. He further indicated that twelve power plants ranging from 600 KV to 6 MW using rice husk as fuel were being put up. Also a policy had been devised for small hydel power plants whereby communities in conjunction with NGO or local firm were being encouraged and assisted to install plants on a nearby canal. A strategy in this regard still needed to be developed. Government was also promoting biogas driven power plants through employment of new designs and successful technologies from Nepal and India while biogas and wind power plants were still being assessed.

Finally, Rab Nawaz emphasized management of the existing energy crises through electricity conservation and appropriate allocation giving industrial sector the highest priority in electricity usage, and power sector a priority in the usage of gas. Both speakers recommended import of gas and coal in place of oil, supported structural reforms in the power sector and use of indigenous and renewable resources.

Abbreviations

Alternative Energy Development Board	AEDB
Billion	B
Billion Cubic Feet per Day	BCFD
Captive Power Plant	CPP
Central Power Purchase Agency	CPPA
Distribution Company	DISCO
Energy Purchase Agreement	EPA
Exec. Committee of Natl Economic Council	ECNEC
Generation Company	GENCOs
Giga Watt Hours	GWH
Independent Power Producer	IPP
Karachi Electric Supply Company	KESC
Kilo Watt Hour	KWH
Least Cost Generation Plan	LCGP
Lahore Electric Supply Company	LESCO
Liquid Natural Gas	LNG
Mega Watts	MW
Thousand British Thermal Unit	MBTU
Million British Thermal Unit	MMBTU
Millions of Cubic Feet per Day	MMCFD
Million Tons of Oil Equivalent	MTOE
Ministry of Water & Power	MW&P
National Electric Power Regulatory Authority	NEPRA
National Power Plan	NPP
National Power Policy 2013	NPP2013
National Power System Extension Plan	NPSEP
National Transmission and Despatch Company	NTDC
Oil and Gas Development Company	OGDC
Oil and Gas Regulatory Authority	OGRA
Pakistan Atomic Energy Commission	PAEC
Pakistan Electric Power Company	PEPCO
Pakistan Petroleum Limited	PPL
Pakistan State Oil	PSO
Petroleum Institute of Pakistan	PIP
Planning Commission	PC
Power Holding Company Limited	PHCL
Private Power Investment Board	PPIB
Punjab Power Development Board	PPDB
Punjab Power Development Company	PPDC
Run Of the River Project	RORP
Sui Northern Gas Pipelines Limited	SNGPL
Sui Southern Gas Company Limited	SSGC
Transnational Pipelines	TNPs
Turkmenistan Afghanistan Pakistan India	TAPI
Water & Power Development Authority	WAPDA

International Conference

Social Change and Security Imperatives: Challenges for Leadership and Democratic Governance in Pakistan

12-13, December, 2013

Executive Seminar Room, E-002, CPPG

The Centre for Public Policy and Governance (CPPG), Forman Christian College (A Chartered University), Lahore is organizing an international conference in collaboration with the Embassy of France in Pakistan.

Background Note

In the past four decades Pakistani society and state has undergone enormous transformation. Resultantly, the socio-economic and politico-cultural milieu of Pakistan appears complex, at times paradoxical and demands deeper understanding and inquiry of these drivers. The state continues to be driven by security considerations in defining its national and regional ambitions. What can be done to bridge the gap between the pressing social transformations and security considerations of the state? The political leadership, political parties and the military are confronted with combating these challenges. However, the critical question remains: do they have the capacity, vision and the will to succeed? This conference aims to explore some of these issues and concerns, which hopefully should improve our understanding of Pakistan and its predicaments.

Conference Themes

The key themes and sub themes are as follows:

1. Security imperatives and Regional Environment (including relations with US, China, India, Afghanistan and other regional actors)
2. Governance and Terrorism
3. Leadership and Democracy
4. Elite Transformations and Economic Development
5. Social Change: How impact of technology (such as internet, satellite and social media) is affecting religious discourse and is changing culture and values

Visitors and Activities

January 10, 2013
CPPG arranged a seminar by Mr. Charles Ramsey, Executive Assistant to the Rector FC College on South Asian Sufis: Deviation and Destiny.

January 14, 2013
CPPG arranged a Round Table Discussion on Indus Water Treaty, Trans-boundary Water Issues and Prospects of Peace in South Asia in collaboration with the History Department. Panelists included Dr. Daniel Haines, University of London; Dr. Douglas Hill, University of Otago, New Zealand; and Mr. Feisal H. Naqvi, corporate lawyer and litigator.

January 16 & 17, 2013
CPPG arranged a seminar by Dr. Adam K. Webb, Resident Associate Professor of Political Science at the Johns Hopkins Nanjing Centre, China on Global Growth to 2050: Demographic Trends and World Order and Deep Cosmopolitanism: A Different Model of Globalization.

February 6, 2013
Director, CPPG attended the Urban Unit organized Partners' Consultation Meeting on the 2nd Pakistan Urban Forum.

February 7, 2013
CPPG arranged a seminar on Designing a Framework for Peace Education in a Pluralist Society with Dr. Amineh A. Hoti, Study Centre at Cambridge; Dr. Hafiz Abdul Ghani, Department of Religious Studies and Rev. Dr. Majid Able, Naulakha Presbyterian Church, Lahore.

February 21, 2013
CPPG arranged a seminar on The Political Economy of Indus Water by Dr. Akmal Hussain, Distinguished Professor of Economics, Forman Christian College.

February 25, 2013
CPPG arranged a seminar on Global History from an Islamic Angle by Dr. Francis Robinson, Sultan of Oman Fellow, Oxford Centre for Islamic Studies.

February 22, 2013
Director, CPPG attended a consultative workshop on Opportunities for Dutch Companies to do Business in the Water Supply and Sanitation Sector of Pakistan organized by the Embassy of Netherlands in Pakistan.

February 28, 2013
CPPG arranged a seminar on Draft Punjab Freedom of Information Act by Mr. Toby Mendel, Executive Director of the Centre for Law and Democracy.

March 15, 2013
CPPG arranged a seminar on The Charismatic Leadership of Quaid–e–Azam Mohammad Ali Jinnah and the Creation of Pakistan by Dr. Sikandar Hayat, Professor of History and Public Policy, Forman Christian College.

March 19, 2013
Director, CPPG attended a panel discussion on Governance: General Perspective at National Management College.

March 25, 2013
Director, CPPG was invited by Packages Corp. for a meeting on Challenges & Opportunities Facing Pakistan's Economy.

March 28th, 2013
Director, CPPG was invited by the UNFPA Core Group for a Panel Discussion on Population Development.

April 03, 2013
Director, CPPG gave a talk on Issues of Governance and Service Delivery at the Provincial Level at National Management College.

April 29, 2013
CPPG arranged a policy dialogue on Youth Radicalization in Punjab: how identity and social movement are shaping it? with Mr. Raheem Ul Haque, CPPG; Dr. Ayesha Siddiqa, Defense Analyst; Dr. Manzar Zaidi, author and expert in Terrorism Studies; and Mr. Amir Rana, Pakistan Institute for Peace Studies.

May 29, 2013
CPPG arranged a seminar on State, Religion and Democracy with Dr. Nuri Tinaz, Marmara University, Turkey; and Dr. Ali Murat, Fatih University, Turkey.

June 10, 2013
CPPG arranged a seminar on Pakistan and Afghanistan: Future Perspectives on Bilateral relations, the Taliban and the impending U.S. Withdrawal by Ambassador Riaz Mohammad Khan.

June 18, 2013
CPPG arranged a seminar on Motorcycle Diaries: Media Representation and the Changing Urban & Political Realities by Mr. Tahir Mehdi, author and journalist.

June 26-27, 2013
CPPG arranged a short term training on Statistical System of Pakistan, led by Mr. Shamim Rafique, DG, Bureau of Statistics, Punjab.

July 10 & August 20, 2013
CPPG arranged an Open House for the new batch of Executive MA in Public Policy 2013-14

July 31, 2013
Ms. Ai Morita, Associate Program Coordinator, Church World Service (CWS) Capacity Building Program met the Director to discuss collaborative opportunities.

August 21, 2013
Director, CPPG gave a talk on Development of Public Policy in Pakistan at the National Defence University.

September 5, 2013
CPPG arranged a policy dialogue titled Electoral Administration in Elections 2013 – Dynamics, Issues and Lessons Learnt with Mr. Abdul Waheed, Election Commission of Pakistan; Mr. Ejaz Chaudhry, Pakistan Tehreek-e-Insaf; and Mr. Moayyed Jafri, Correspondent, The News International.

September 10, 2013
Director, CPPG gave a talk on Governance: General Perspective at the National Management College.

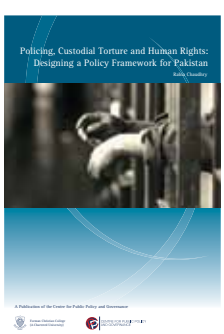
September 12, 2013
CPPG in collaboration with The United States Educational Foundation in Pakistan arranged a workshop on Assessing the Status of Returning Fulbright Fellows in Public Policy: Discipline of Public Policy, Its Prospects and Future Direction.

September 25, 2013
CPPG arranged a policy dialogue on Informal Sector, Issues and Challenges: The Way Forward with Ms. Ume-Laila Azhar, Executive Director Homenet Pakistan.

CPPG Student Achievements

Mr. Adnan Rasul (Batch 2011-12) has joined the PhD program at the University of Georgia, USA on full scholarship. Ms. Rabia Chaudhry (Batch 2011-12) has won a DAAD PhD scholarship at the University of Bonn, Germany.

Recent Publications



Policing, Custodial Torture and Human Rights: Designing a Policy Framework for Pakistan

Faculty & Staff

Dr. Saeed Shafqat | Professor & Director
> PhD University of Pennsylvania
> saeedshafqat@fccollege.edu.pk

Dr. Sikandar Hayat | Professor
> PhD Quaid-d-Azam University
> sikandarhayat@fccollege.edu.pk

Raheem ul Haque | Sr. Research Fellow
> Masters Intl. Public Policy, SAIS, Johns Hopkins University
> raheemhaque@fccollege.edu.pk

Dr. Imdad Hussain | Assistant Professor
> PhD National Graduate Institute for Policy Studies
> imdadhussain@fccollege.edu.pk

Rashid Munir Kahloon | Research Fellow
> MSc (International Banking and Finance), Universtity of Glasgow
> rashidkahloon@fccollege.edu.pk

Hajra Zafar | Research Fellow
> Masters in Economics, Boston University
> hajrazafar@fccollege.edu.pk

Reema Gill | Program Manager
> MA Economics, Peshawar University
> reemagill@fccollege.edu.pk

Nayyer Aftab | Administrative Assistant
> BA (Hon) Mass Comm. FC College
> nayyeraftab@fccollege.edu.pk

Board of Advisors

: Dr. William B. Eimcke is the founding director of the Picker Center for Executive Education of Columbia University's School of International and Public Affairs.
: Barrister Shahid Hamid, former Governor of Punjab currently manages his own Law Firm.
: Dr. Salman Humayun, Deputy Chief of Party, Education Sector Reform Assistance Program (ESRA).
: Dr. Akmal Hussain, a development economist specializing in action research. He runs a private manufacturing firm, Sayyed Engineers (Private) Limited.
: Dr. Saba Gul Khattak, former Executive Director SDPI specializes in comparative politics and state theory.
: Dr. Anjum Khurshid (MBBS, MPAFF), Assistant Professor and Director of the Health and Behavioural Risk Research Centre, University of Missouri.
: Dr. Naushin Mahmood, Senior Researcher at Pakistan Institute of Development Economics (PIDE) specializes in demography and population issues.
: Javed Masud, former Managing Director and CEO The Pakistan Credit Rating Agency Limited.
: Dr. Jack Nagel, Professor of Political Science, Business and Public Policy, Wharton, University of Pennsylvania.
: Jean-Luc Racine, Senior CNRS Fellow at the Center for South Asian Studies, School for Advanced Studies in Social Sciences, Paris focuses on geopolitics of South Asia.
: Babar Sattar, LLM, a Rhodes Scholar who writes on social, political and legal issues and runs a law firm AJURIS.
: Dr. Shafqat Shehzad, Associate Professor Comsat University, Islamabad and former Research Fellow at SDPI specializes in health economics.
: Dr. Ayesha Siddiqua is a security studies expert specializing in defense decision-making and civil-military relations in South Asia.

Contact Us

Centre for Public Policy & Governance (CPPG)
E – 017 & 018, F.C. College (A Chartered University)
Feroz pur road, Lahore - 54600
Phone: 042. 9923 1581 – 88 Ext. 388
Email: cppg@fccollege.edu.pk, http://cppg.fccollege.edu.pk

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