

A Framework for Optimizing Power Sector Costs & Foreign Currency Outflow

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The Pakistan Business Council

Overview

The Pakistan Business Council (PBC) is a research-based business advocacy platform established in 2005. It is now supported by over 100 private sector local and multinational businesses with significant investment in and long-term commitment to sustainable growth of the country. They come from 14 countries, have leading roles in 17 major sectors of the formal economy, generate 40% of annual exports, contribute a third of Pakistan's total tax revenues and employ three million people. Their combined sales represent every 9th Rupee of Pakistan's GDP.

PBC's major objectives are to advocate policies that lead to creation of jobs, value-added exports and reduction in import reliance through improved competitiveness of manufacturing, services and the agriculture sectors. It also promotes formalization of the economy.

PBC's over-arching theme, **"Make-in-Pakistan"** consists of three pillars: **"Grow More/Grow Better"**, **"Make More/Make Better"** and **"Serve More/Serve Better."** Its evidence-based advocacy is backed by over a hundred studies to date through its full-time research team, supplemented by collaborative research with renowned industry experts and economists. Through its **Centre of Excellence in Responsible Business (CERB)**, PBC works to build capacity and capability of businesses beyond its membership, to adopt high environmental, social and governance standards. PBC holds conferences, seminars and webinars to facilitate the flow of relevant information to all stakeholders in order to help create an informed view on the major issues faced by Pakistan. Through its presence in Islamabad and Karachi, it works closely with relevant government departments, ministries, regulators and institutions, as well as other stakeholders including professional bodies, to develop consensus on major issues impacting the economy.

PBC is a pan-sectoral, not-for-profit, Section 42 entity. It is not a trade body; therefore, it does not advocate for any specific business sector. Rather, its key advocacy thrust is on easing barriers that thwart competitiveness of businesses and investment in Pakistan. Further information on the PBC is available on: www.pbc.org.pk.

Executive Summary

Pakistan suffers from the highest electricity costs in the region. The competitiveness of industry, its capacity to create employment and generate exports is impeded by the burden of unutilized generation capacity, inefficiencies in transmission, theft, non-recovery and cross-subsidies to residential consumers. High electricity tariffs incentivize theft and increase the reluctance of domestic users to switch out of less efficient, underpriced and fast depleting gas. To make matters worse, there is substantial reliance on imported fuel for power generation and the transmission system is inadequate to maximize the use of cheaper renewable and coal power from the South. Until a rail link is created to transport coal from Thar, reliance on imported coal will continue.

The objective of reforms should therefore be on reducing reliance on imported fuel, renegotiating the tenor and terms of Chinese debt to IPPs, making power more competitive by incentivizing consumption of unutilized generation capacity, addressing the inefficiencies, theft and under-recovery in distribution and making transmission more stable and reliable. A summary of opportunities in the immediate to medium term, covered in more detail in this paper, are:

	Page	Savings in Forex Outflow or PKR	Impact on the Power Tariff
Reduce transmission, distribution and recovery losses of DISCO's	3	Rs. 175 Bn	Rs.1.25/unit
Restructure tenor and cost of Chinese IPP debt	4	US\$ 1.7 Bn pa	Rs. 7/unit for power from CPEC projects equiv. to Rs. 4/unit on national mix
Make industry competitive	4	Cost Rs. 180 Bn, offset by positive impact of higher exports, imports, jobs etc	Rs. 1.29/unit cost
Expedite south-to-north transmission through private sector investment	5	Rs. 200-265 Bn	Rs. 1.4-1.9/unit
Price incremental power in winter months at a discount to optimize capacity usage	5	Rs. 17.5 Bn	Rs. 0.1/unit
Convert the three imported coal projects to local Thar coal - Initially in a 20% blend - In 2-4 year to 100% Thar replacement	6	(20%) \$185 Mn – Payback about 1 yr (100%) \$918 Mn. Payback <2 yrs	Rs.0.14/unit Rs. 0.48/unit
Aggregate impact of all measures		Forex Saving: \$1.9 to \$2.6 Bn pa Rs. Savings: 213 to 278 Bn	Rs. 5.6 – 6.44/unit

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Outline Proposals to Optimize Power Sector Cost and Foreign Currency Outflow

	Proposal	Annual Impact	Tariff Impact/Unit
1	Reduce T&D and recovery losses of DISCO's <ul style="list-style-type: none"> As per the NEPRA report (2021-22) – T&D losses of all DISCOs (excluding KE) were 17% vs NEPRA's target of 13%, and the recovery rate was 90% vs target of 100%. In contrast KE's T&D loss was 14% and the recovery rate was 96%. In the short run, it should be possible to achieve at least an improvement of 2% in T&D and 3% in recovery, i.e. a total of 5%. Longer-term improvement will require capex. A 5% savings translates to approx. Rs.175 billion per annum or Rs. 1.25/unit. 	Rs. 175 Bn	Rs 1.25/unit
2	Restructure tenor and cost of Chinese IPP debt <ul style="list-style-type: none"> There are currently 17 power projects with approximately 11,000 MW dependable generation capacity funded by Chinese debt The estimated foreign debt borrowed to finance these projects is \$15.0 Billion Most of this debt is priced on commercial terms, which at current LIBOR rate amounts to approx. 10% pa, with a repayment term of 10 years. This currently results in debt servicing obligations of \$2.4 Billion per annum over the remaining period of their original 10 year terms As 100% of this debt is backed by GOP guarantee, efforts should be made to convert it into a G2G loan with a 30-year repayment term at a concessionary rate of 2% pa. This would reduce annual payments to around \$700 Million (half from extension of tenor and half from reduction in interest cost) – saving \$1.7 Billion aggregate in foreign exchange payment every year for the unexpired period of the original 10 year term of plants. Resultantly, capacity payments to these plants will reduce by Rs. 7/KWh, which 	US\$ 1.7 Bn pa for reminder period of original loan term.	Rs. 7/unit for CPEC related projects and Rs. 4/unit overall on the national mix

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	Proposal	Annual Impact	Tariff Impact/Unit
	translates to approximately Rs. 4/KWh on a full basket basis		
3	Make industry competitive <ul style="list-style-type: none"> Reduce the industrial tariff from Rs. 37/unit or 13 cents (likely to increase) to a regional average of 9 cents/unit to generate jobs, exports, tax revenue and to reduce import reliance. Tariff for industry is burdened by inefficiencies of generation, transmission and distribution companies. Additionally, cross subsidy is loaded on to the industrial tariff. Overseas customers of our exporters can't be expected to pay for this, nor can domestic manufacturing compete with imports. Proposal is to reduce industrial tariff by Rs. 11 per unit to Rs. 27 (or 9 cents) to make industry competitive Assuming 25% of total current demand is from industry, the gross cost of this would amount to Rs. 385 Billion (140,000 Gwh x 25% x Rs.11 = Rs.385 billion). However, this will partly be offset by increased demand. Assuming 1,500 MW increase in offtake, the incremental capacity charge recovery will amount to Rs. 208 Billion (1,500 x 24 x 365 = 13,000 Gwh x Rs.16 = Rs.208 billion). So, the net cost will be around Rs.180 billion which will be offset by benefits of increased exports, lower imports, more jobs and higher tax revenue through improved competitiveness of industry 	Net cost Rs. 180 Bn neutralized by economic value of additional jobs, exports, taxes and reduction in import reliance	Rs. 1.29/unit offset by incremental benefits from taxation, exports, etc
4	Expedite south-to-north transmission through private sector investment <ul style="list-style-type: none"> Currently there is excess generation capacity of low-cost power plants (wind, solar and imported coal) which cannot be evacuated to the North due to transmission and south to north distribution constraints. This results in higher cost by running generation plants 	Rs. 200 to 265 Bn	Rs 1.4 to 1.9/unit

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	<p>on more expensive fuel (LNG and RFO) in the North</p> <ul style="list-style-type: none"> Based on 140,000 GwH (average 16,000 MW) of demand for the full year, split into summer: 90,000 GwH and winter: 50,000 Gwh and on July & August 2023 data of approx. 22% generation on LNG and RFO costing approx. Rs25 – (fuel cost only) vs imported coal costing Rs.15 per unit, the cost saving in the summer months would be approx. 90,000 GwH x 22% x Rs. 10 = Rs. 200 billion. Similarly in the winter months when demand is lower and LNG and RFO production would be around 13%, the difference would be 50,000 GwH x 13% x Rs. 10 = Rs. 65 billion. Hence total saving would be around Rs.265 billion per annum. Understanding that full displacement / conversion cannot happen, the realistic potential is still Rs.200 billion per annum 		
5	<p>Price incremental power in winter months at a discount to optimize capacity usage</p> <ul style="list-style-type: none"> This would incentivize switch of domestic appliances from use of gas to electricity Current capacity charges are approx. Rs.16 per unit (based on approx. 140,000 GwH). Fuel charges in winter are likely to be around Rs.8.per unit. However, as there is likely to be a constraint on availability of hydel, the incremental fuel cost may amount to Rs.12 per unit based on use of imported coal. If price for incremental power for 6 months (October thru March) is priced at say Rs.16 per unit and approx. 1,000 MW extra power is consumed in these months from increase in domestic appliances usage, then incremental revenue will be 1,000mw x 24 hours x 180 days = 8,640 Gwh x Rs. 4 (Rs. 16 selling price less Rs.12 fuel cost) = Rs. 17.5 billion which is equivalent of Rs.0.125 on all units sold throughout the year. 	Rs. 17.5 Bn	Rs. 0.1/unit

	Proposal	Annual Impact	Tariff Impact/Unit
6	<p>Convert the three imported coal projects to local Thar coal</p> <ul style="list-style-type: none"> • The primary goal of this is to reduce outflow of foreign exchange through replacement of imported coal with coal from Thar. There is a small positive impact on the tariff too. • The 3 imported coal plants (Sahiwal, Port Qasim, China Hub) use approx. 3.5 million tons per annum of sub bituminous (6,000 Kcal) at full load. They together import of 10.5m tons annually. • Price of imported coal is assumed to be \$140 / ton delivered (API4 – current spot) • Thar coal (3,000 kcal) cost will be approx. \$37 +\$13 freight = \$50 delivered. Out of this \$50, the FX portion, mainly the FX cost of mine extraction and movement equipment and imported fuel for transportation is around \$20 / Thar ton • In terms of heating value 1 ton of sub bituminous coal = 2 tons of Thar lignite coal (approx.) • Plants will have same efficiency (39%) whether they run on either type of coal • Mine capex for 20% blending (3.5m tons) will amount to \$200m and it would take 2 years to achieve this. • For 100% replacement (17.5 Mn tons), investment of \$1.2 billion would be required and it would take between 4-5 years. • A rail line is already being built so incremental cost of rolling stock would amount to \$100m only in the case of 100% utilization • Fichtner did a basic feasibility of converting these plants to Thar coal and came up with 2 options • Option 1 – 20% blending with no modifications but capacity reduces to 85% of current capacity • Option 2 - \$425m capex for 100% use of Thar but capacity reduces to 85% of current capacity 		

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<p>Option 1 – 20% blending – FX savings</p> <ul style="list-style-type: none"> No capex in plant or rail, \$200m capex for the mine. Reduction in coal import bill (FX) – 10.5m x 20% x \$140 x 85% = \$255m \$ component of incremental Thar production 10.5m (sub bituminous) x 2 (convert to Thar tons) x 20% (blending) x 85% (capacity reduction) = 3.5m tons x \$20 = \$70m So net saving in \$ terms \$255m - \$70m = \$185 Mn per annum on coal, vs one time capex of \$200m, hence payback period of a little over 1 year. <p>Option 1 – 20% blending – Tariff</p> <ul style="list-style-type: none"> Using above assumptions, the energy portion of the tariff for pure imported coal is about 5.2 cents while Thar coal would be 3.8 cents. With 20% blending the tariff would be 4.9 cents or approx. \$70m saving per annum (Rs.20 billion) 	<p>Annual Forex saving of \$185 Mn. One-time capex of \$200 Mn. Payback: a little over 1 year</p> <p>Rs. 20 Bn</p>	<p>Rs. 0.14/unit positive impact on the national mix</p>
<p>Option 2 – 100% use of Thar – FX savings</p> <ul style="list-style-type: none"> Capex on plant would be approx. \$500m (\$425 as per Fichtner study with 20% contingency) and \$100m on the rail rolling stock etc and \$ 1.2billion on the mine - so a total of approx. \$1.8 billion Reduction in coal import bill (FX) – 10.5m x \$140 x 85% = \$1,275 Mn \$ component of incremental Thar production 10.5m (sub bituminous) x 2 (convert to Thar tons) x 85% (capacity reduction) = 18m tons x \$20 = \$360m So net saving in \$ terms \$1,275m - \$360m = \$915m per annum on coal vs. one time capex of \$1,800m – payback a little under 2 years. <p>Option 2 – 100% use of Thar – Tariff Impact</p> <ul style="list-style-type: none"> The energy tariff would reduce from 5.2 cents to 3.8 cents or saving of 1.4 cents Cost of incremental capex (plant only) will be approx. 0.4 cents still giving a reduction of 1.0 cents per unit - annualized \$230m = Rs. 67 billion or Rs. 2.9/unit of power from 	<p>Annual Forex saving of \$915 Mn. One-time capex of \$1,800 Mn. Payback period: a little under 2 years</p> <p>Rs. 67 Bn /annum</p>	<p>Rs.0.48/unit positive impact on the national mix</p>

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	<p>these plants or Rs. 0.48/unit on the national mix.</p> <ul style="list-style-type: none"> • Cost of incremental tariff of mine + rail is already built into the price of coal and inland freight 		

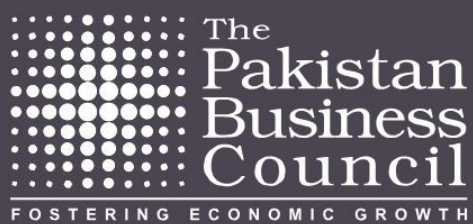
THE PBC MEMBER COMPANIES





THE PBC AFFILIATES





**8th Floor, Dawood Centre, M.T. Khan Road,
Karachi, Pakistan**

 **+ 92 21 3563 0528 - 29**

 **+ 92 21 3563 0530**

**Ground Floor, Unit No. 7, Block 3001, Rehmat
Plaza, Blue Area, Islamabad, Pakistan**

 **+ 92 51 8444 008**

 **+ 92 51 8444 009**

 **www.pbc.org.pk**