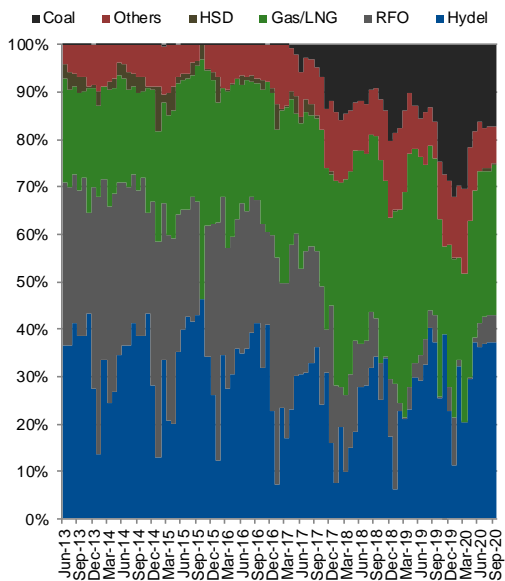


## Sector Update

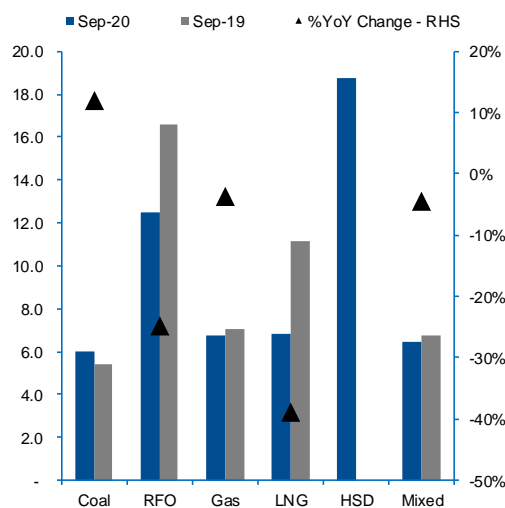
## Monthly Power Generation Mix (Sep-20) - Gwh

Source	Sep-20	Sep-19	YoY	1QFY21	YoY
Hydel	4,872	5,053	-4%	15,749	3%
RFO	762	817	-7%	2,415	15%
Gas/LNG	4,129	4,483	-8%	13,100	-10%
HSD	72	-	n/m	283	n/m
Coal	2,283	2,232	2%	7,394	20%
Others	986	1,036	-5%	3,504	-6%
Total	13,104	13,621	-4%	42,445	1%

## Exhibit: Fuel Wise Generation Mix (%)



## Exhibit: Fuel Wise Cost of Generation - Sep-20 (PKR/Kwh)



Source: NEPRA &amp; IGI Research

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## Power Generation &amp; Distribution

## Sep-20: Generation down by 4%YoY on account of lower generation through Hydel/Gas-LNG

- As per latest data available on NEPRA's website, overall power generation during the month of Sep-20 declined by 4% YoY to 13,104Gwh. Power production through Coal clocked in at 2,283Gwh up by +2% YoY.
- Power generation through RFO in Sep-20 declined by 7% YoY (down by 55Gwh) to 762Gwh. Gas/LNG based power generation dropped by 8% YoY (354Gwh) to 4,129Gwh in Sep-20. As per NEPRA, power cost on RFO during Sep-20 is down by 25% YoY (or up by +2% MoM) to PKR 12.45/Kwh. However, gas price dropped to PKR 6.77/Kwh down by 4% YoY (down 4% MoM) while generation cost through LNG stood PKR 6.79/Kwh, down by 39% YoY or 3% MoM.
- Post Covid-19 outbreak, generation mix has remained relatively volatile owing to IMO 2020 and substantial drop in oil prices which pushed FO plants up in the merit order list during early 1HFY20. Due to pricing mechanism of LNG, oil prices have a laggard impact on LNG prices and thus LNG prices are down by 34% in Sep-20 since Apr-20.

## Power production dropped by 4%YoY during Sep-20

As per latest data available on NEPRA's website, overall power generation during the month of Sep-20 declined by 4% YoY to 13,104Gwh. Power production through Coal clocked in at 2,283Gwh up by +2% YoY, while generation through Gas-LNG/RFO/Hydel decreased by 8%/7%/4% YoY to 4,129/762/4,872Gwh during Sep-20. Generation dropped by 10% MoM during Sep-20 compared to Aug-20. This brings total generation for 1QFY21 to 42,445Gwh up by +1% YoY primarily led by +20%/+15%/+3% YoY incline in production through Coal/RFO/Hydel contributing 17%/6%/37% of the total power generation while contribution from Gas/LNG based power generation is down to 31% as compared to 35% in 1QFY20.

## FO: Generation down by 7%YoY in Sep-20

Power generation through RFO in Sep-20 declined by 7% YoY (down by 55Gwh) to 762Gwh, owing to lower generation from KAPCO Block II, GENCO Block III and Kohinoor Energy (cumulatively down by 350Gwh) while generation from KAPCO Block I, Pakgen, Attock Gen, Hub Plant, Atlas and NCPL was cumulatively up by 254Gwh. This brings total generation for 1QFY21 to 2,415Gwh up by +15% YoY owing to higher generation from Atlas, KAPCO Block I, Liberty, Lalpir, Pakgen and Narowal.

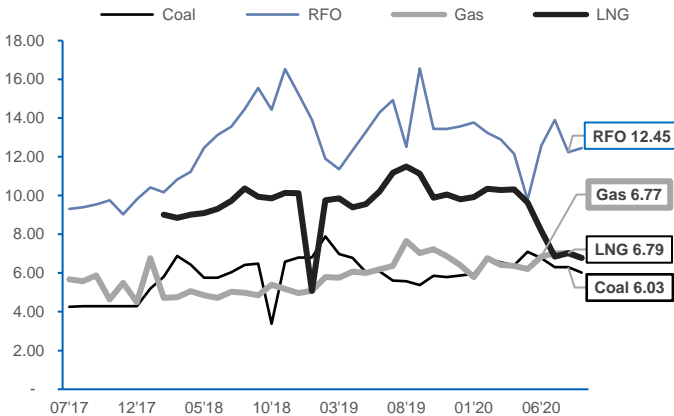
## Gas/LNG generation down by 8%YoY during Sep-20

Gas/LNG based power generation dropped by 8% YoY (354Gwh) to 4,129Gwh in Sep-20 on the back of lower generation from a) GENCO II-III (contributing 214Gwh), KAPCO II-III (down by 195Gwh) and Saif (down by 88Gwh) while generation from other smaller IPPs increased during the month of Sep-20. This brings total generation in 1QFY21 to 13,100Gwh down by 10% YoY led by lower generation from KAPCO I-III, GENCO I-III and smaller IPPs.

**Generation cost on RFO down by 25% YoY to PKR 12.45/Kwh during Sep-20**

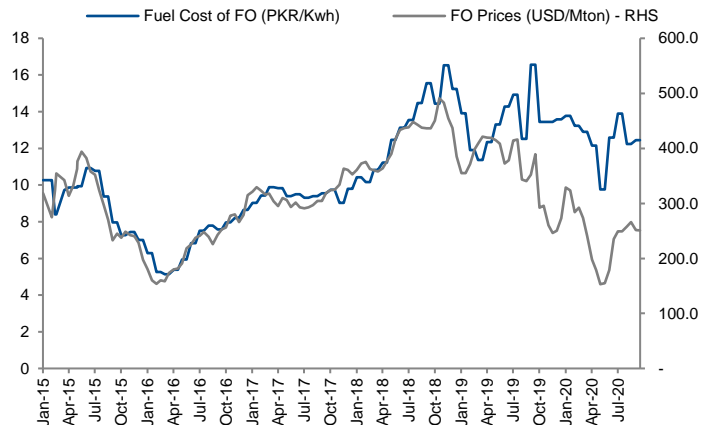
As per NEPRA, power cost on RFO during Sep-20 is down by 25% YoY (or up by +2% MoM) to PKR 12.45/Kwh. However, gas price dropped to PKR 6.77/Kwh down by 4% YoY (down 4% MoM) while generation cost through LNG stood PKR 6.79/Kwh, down by 39% YoY or 3% MoM. For the month of Oct-20 to date, international RFO (180cst bunker fuel) prices have averaged USD 257/Mton as compared to USD 251/Mton in the preceding month.

**Exhibit: Cost of generation on FO and Gas (According to Data released by NEPRA)**



Source: IGI Research, NEPRA

**Exhibit: FO Prices (USD/Mton) and Fuel Prices (PKR/Mton)**



**FO plants moved up slightly on merit order list during Sep-20**

FO plants have moved up slightly in the merit in Sep-20 on account of higher demand during summer season. Cost of generation remained relatively mixed on monthly basis as Hub, Narowal, NCPL, Liberty, PKGP and NPL witnessed a rise in fuel cost thus moving down in the merit order list. Mostly FO plants recorded a slight movement down the pecking order as generation cost of LNG plants went down by nearly 4% MoM. Coal plants remained relatively unchanged in the merit order list.

**Outlook**

Post Covid-19 outbreak, generation mix has remained relatively volatile owing to IMO 2020 and substantial drop in oil prices which pushed FO plants up in the merit order list during early 1HFY20. Due to pricing mechanism of LNG, oil prices have a laggard impact on LNG prices and thus LNG prices are down by 34% in Sep-20 since Apr-20. However going forward, as demand picks up post Covid-19 and diversion of gas to domestic consumer during winter season, we believe FO plants are likely to remain operational whereas in the long term contribution of FO plants in total generation mix would remain low whereas LNG and coal contribution would increase.

**Exhibit: Pakistan Merit Order list**

Plant	Fuel Type	Capacity (MW)	Merit Order List													
			22-Oct-20	7-Oct-20	22-Sep-20	8-Sep-20	25-Aug-20	7-Aug-20	22-Jul-20	7-Jul-20	Jun-20	Mar-20	Dec-19	Jul-19	Dec-18	Jul-18
Hub Plant	RFO	1,200	102	102	106	104	104	108	108	108	108	85	98	82	89	70
Narowal	RFO	214	74	74	76	70	68	69	80	88	86	63	70	76	70	58
Nishat Power	RFO	195	71	70	79	76	76	71	67	50	101	70	72	70	65	63
Nishat Chunian	RFO	196	67	71	78	82	70	78	82	74	84	56	71	66	64	64
Lalpir	RFO	350	47	94	48	96	48	100	56	84	70	52	83	81	69	76
Pakgen	RFO	349	78	60	88	64	82	77	93	86	87	66	90	79	76	79
Attock Gen	RFO	156	54	49	54	63	55	50	49	48	38	21	24	75	52	68
Kohinoor Energy	RFO	124	86	56	84	55	85	51	89	42	79	48	51	65	66	69
Saba Power	RFO	126	81	72	74	84	86	88	84	90	89	69	88	78	71	74
Atlas Power	RFO	214	80	80	72	78	79	82	69	89	82	59	69	68	62	65
Gulf Powergen	RFO	62	59	57	59	59	59	60	61	64	62	39	41	43	37	44
Liberty	RFO	196	76	76	81	86	69	76	71	82	63	47	66	56	61	56
CPHGC	Coal	1,220	6	6	7	7	8	8	8	9	9	5	6	-	-	-
Engro Power	Coal	660	3	3	3	3	3	3	3	3	3	3	3	4	-	-
Port Qasim	Coal	1,320	4	4	4	4	4	5	5	7	8	6	5	6	9	15
Sahiwal Coal	Coal	1,320	11	11	9	9	10	11	11	11	19	12	9	16	24	25
QATPL	RLNG	1,180	10	9	10	10	9	9	9	8	7	25	23	39	33	31
Haveli Bahdur Shah	RLNG	1,230	7	7	6	6	6	6	6	5	5	22	21	36	31	29
Baloki	RLNG	1,320	8	8	8	8	7	7	7	6	6	24	22	38	32	30
Halmore	RLNG	199	20	16	17	18	17	17	17	14	13	49	43	49	40	37
Sapphire	RLNG	203	19	14	16	16	18	18	18	15	14	50	42	47	38	35
Saif	RLNG	204	21	17	18	19	19	19	19	16	15	51	44	48	39	36
Orient	RLNG	213	15	12	12	13	14	14	14	13	12	43	39	45	36	33
Davis	RLNG	10	50	43	44	44	47	41	46	41	42	88	86	84	74	67
Rousch	RLNG	395	26	22	24	25	25	25	25	22	22	61	53	54	54	45
Nandipur	RLNG	411	23	19	19	20	20	20	20	17	16	38	33	42	34	32
FKPCL	Gas	151	35	32	32	32	32	33	31	29	30	65	62	65	49	34

**Exhibit: Fuel cost of IPPs**

Plant	Fuel Type	Capacity (MW)	Fuel Cost (PKR/Kwh)												
			22-Oct-20	7-Oct-20	22-Sep-20	8-Sep-20	25-Aug-20	7-Aug-20	22-Jul-20	7-Jul-20	Jun-20	Mar-20	Dec-19	Jul-19	
Hub Plant	RFO	1,200	17.3	17.3	17.3	17.3	17.3	17.6	17.2	17.2	17.14	17.14	17.41	17.44	
Narowal	RFO	214	12.3	12.3	12.5	11.6	11.6	11.6	12.4	13.1	13.08	13.07	13.74	14.95	
Nishat Power	RFO	195	11.5	11.8	12.5	12.1	12.1	11.8	11.2	9.4	14.86	13.91	13.74	14.34	
Nishat Chunian	RFO	196	11.2	11.8	12.5	12.6	11.7	12.0	12.4	11.7	12.61	12.05	13.62	13.63	
Lalpir	RFO	350	10.4	16.2	10.9	16.1	10.8	16.0	11.2	13.5	12.83	12.80	16.12	16.97	
Pakgen	RFO	349	13.5	12.1	15.1	12.1	14.0	13.2	15.3	13.9	14.33	14.33	16.40	16.31	
Attock Gen	RFO	156	9.8	9.8	10.1	10.8	10.2	9.8	9.7	9.2	8.64	8.79	8.58	14.46	
Kohinoor Energy	RFO	124	14.1	11.0	13.8	10.7	13.7	10.3	14.0	9.5	12.60	11.93	12.10	14.18	
Saba Power	RFO	126	14.1	13.1	13.2	14.0	15.1	14.1	13.7	14.7	14.68	14.08	16.36	16.06	
Atlas Power	RFO	214	12.6	12.6	11.8	12.2	12.4	12.3	11.2	13.2	12.30	12.33	13.50	14.05	
Gulf Powergen	RFO	62	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.85	9.85	9.85	9.85	
Liberty	RFO	196	12.1	12.3	12.6	13.4	11.5	11.8	11.4	12.1	10.52	11.30	13.12	12.84	
CPHGC	Coal	1,220	5.0	5.0	5.7	5.7	6.1	6.1	6.1	6.1	5.93	5.07	5.54	-	
Engro Power	Coal	660	2.7	2.7	2.7	2.7	2.5	2.2	2.2	2.2	2.14	2.07	2.08	3.68	
Port Qasim	Coal	1,320	4.4	4.4	4.3	4.3	4.8	5.8	5.8	5.8	6.11	5.42	5.09	5.46	
Sahiwal Coal	Coal	1,320	6.8	7.5	6.3	6.3	6.7	7.0	7.0	7.0	7.69	8.20	6.88	7.17	
QATPL	RLNG	1,180	5.9	6.0	6.1	6.1	6.1	6.2	-	5.7	5.70	10.08	9.38	10.03	
Haveli Bahdur Shah	RLNG	1,230	5.9	6.0	6.0	6.0	6.1	6.1	6.1	5.7	5.65	9.94	9.25	9.89	
Baloki	RLNG	1,320	5.9	6.0	6.1	6.0	6.1	6.1	6.1	5.7	5.69	10.07	9.37	10.02	
Halmore	RLNG	199	7.2	7.3	7.4	7.4	7.5	7.5	7.5	7.0	6.97	12.32	11.46	12.07	
Sapphire	RLNG	203	7.2	7.3	7.4	7.4	7.5	7.5	7.5	7.0	6.98	12.35	11.46	12.07	
Saif	RLNG	204	7.2	7.3	7.4	7.4	7.5	7.5	7.5	7.0	6.99	12.35	11.49	12.07	
Orient	RLNG	213	7.2	7.3	7.4	7.4	7.5	7.5	7.5	7.0	6.98	12.35	11.49	12.07	
Davis	RLNG	10	9.9	10.0	10.1	10.2	10.2	10.0	10.2	9.6	9.55	16.91	15.78	17.10	
Rousch	RLNG	395	8.0	8.1	8.1	8.1	8.3	8.3	8.2	7.7	7.69	13.60	12.65	13.69	
Nandipur	RLNG	411	7.3	7.4	7.5	7.5	7.6	7.6	7.6	7.1	7.08	11.30	10.52	11.38	
FKPCL	Gas	151	8.3	8.4	8.5	8.5	8.6	8.6	8.5	8.0	7.99	13.14	13.14	13.06	

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