

THE LEAD/ACID BATTERY INDUSTRY IN PAKISTAN

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Introduction

Pakistan emerged as a sovereign state on August 14, 1947 as a result of the division of the former British India. Its boundaries are Iran in the west, Afghanistan in the north west, India in the east and south east, China in the north east, and the Arabian Sea in the south. The total area of the country is about 800 000 km². The population according to the 1981 census was 84.3 million, increasing at the rate of 3.1% per annum; in 1989 it is estimated to be over 100 million. Pakistan has varied physical regions comprising deserts, fertile Indus Valley plains, snow clad mountains with the five highest peaks in the world after Mount Everest. The south has the coast line along the Arabian Sea and is the gateway to the oil-rich Middle Eastern countries through its biggest port, Karachi.

Pakistan is a developing country and has a low per capita income, *i.e.*, Rs 6252 = US\$ 297.00. Its economy is based on agriculture with a huge network of canals. Wheat, cotton rice, millet and sugar cane are the principal crops. Natural resources are gas, coal, rock salt and gypsum. Exploration for oil is continuing and about one third of its oil requirements are being met from local oil wells. Hydro-electric power is the main source of energy and the expanding industries, consisting of cotton textiles, sugar, cement, chemicals and fertilizers, are most dependent on this power.

Battery industry

Being part of the British Empire up to 1947, cars and batteries were generally imported from the U.K. The main brands were Exide and Lucas. Re-plating was not an unusual feature. In Pakistan, the first attempt to manufacture batteries in an organized manner was made by a small firm in Lahore. It was in the year 1953 - 54 that the Chloride Group decided to set up a plant in Karachi which catered for the whole of Pakistan including what is now Bangladesh.

The following is a list of battery manufacturers in Pakistan, some of which have now closed down:

Exide (previously Chloride Pakistan Ltd.)

AGS (Atlas Batteries in collaboration with GS of Japan)

ABC-FB (Automotive Battery Company in collaboration with Furukawa of Japan)

Lucas Service Pakistan
 National Battery Company
 Yuasa-(Junaid Jouzy) production on and off on a small scale
 Pakride (closed down)
 Grand Battery (closed down)
 FATA (small scale)
 KOBE Battery (on a small scale)
 National Tyre & Rubber Company (closed down).

The more active and organized companies are Exide, AGS and ABC and their combined market share is estimated to be about 85%. The balance is shared by re-platers, smaller manufacturers, and illicit importers.

Trade policy on batteries

There is a ban on the import of automotive batteries. Some industrial types, however, are allowed to be imported through special permission or through International Government tenders.

Raw material can be freely imported. The rate of duties is variable, see Table 1. There is a concessional duty on certain items used in the manufacturing process. Machinery for manufacturing batteries and for balancing and modernization of plants can also be imported through special permission.

Export of batteries is allowed and enjoys rebates or refund of duties on raw material used in the exported items, as well as excise duty and sales tax on the finished product.

Raw materials

Lead

To date, lead has not been mined in the country and, except for recycled metal, is therefore imported. There is no restriction on the source of import. It is estimated that the battery industry imports from 5000 to 6000 tonnes of lead each year. The countries supplying lead are the U.K., Australia, China, Belgium, Netherlands, U.S.A., Switzerland, F.R.G., Malaysia, Canada, Zambia, Burma, and the U.S.S.R. In addition to the requirements of the battery industry, at least an equivalent amount is imported for other industries.

Polypropylene

The total import of this raw material for the battery industry is estimated at 600 tonnes per year. Polypropylene is generally sourced from U.S.A., Belgium, Italy, F.R.G., Japan, U.K., and Australia.

Separators

The battery industry mainly uses glass-mat paper separators, but porvic and MD separators are also employed. The sources of supply are Japan,

TABLE 1

Duty on raw materials for lead/acid battery manufacture

Items	Statutory rate of customs duty (%)	Sales tax (%)	Iqra tax (%)	Surcharge (%)
Lead ingots ^a	10	12.5	5	7
Antimonial lead ^a	10	12.5	5	7
Lead scrap	10	12.5	5	7
Master alloy	10	12.5	5	7
Antimony ^a	10	12.5	5	7
Electric accumulators	80	12.5	5	7
Battery containers, lids and covers	100	12.5	5	7
Separator plates	80	12.5	5	7
Coal dust	20	12.5	5	7
Cork dust	20	12.5	5	7
Brown crepe ^a	20	12.5	5	7
Synthetic rubber ^a	20	12.5	5	7
Tin	10	12.5	5	7
Chopped fibres ^a	40	12.5	5	7
Carbon black	20	12.5	5	7
Vanisperse ^a	40	12.5	5	7
Red lead	40	12.5	5	7
Lead oxide	40	12.5	5	7
Sulphur	20	12.5	5	7
Barium sulphate	40	12.5	5	7
Courlose ^a	40	12.5	5	7
Polypropylene ^a	40	12.5	5	7
Epoxide resins	40	12.5	5	7
Paper and paperboard coated, impregnated, or covered with plastic (excluding adhesive) ^a	50	12.5	5	7
Glass fibre ^a (thin sheets)	40	12.5	5	7
Arsenic metal ^a	20	12.5	5	7
Selenium shot	20	12.5	5	7
Battery manufacturing machinery ^b	20	free	5	7
Mould for				
i) Plastic and rubber	free	free	5	7
ii) Metals	free	free	5	7
Casting machine	free	free	5	7

^aExempted from customs duty in excess of 20% *ad valorem* and whole of sales tax as being imported against SRO 600(1)/83 dated 11-6-83.

^bParts of battery manufacturing machinery: the rate of customs duty applicable to the machine of which they form part.

Thailand, Korea, Taiwan, France, U.K. and Germany. New types of separators are being developed worldwide and the industry is watching new suppliers, with new types at reasonable prices, with interest.

One separator-making plant has been set up in Lahore and is said to be exporting porvic separators to other countries. This plant, however, imports glass mat and MD sheets from Japan to glue and slit to the required sizes.

The total demand for all types of separators is estimated at 55 million pieces. Most of the glass mat and impregnated paper is imported from Thailand.

Rubber

Although 80% of the batteries manufactured in the country are in polypropylene, hard rubber containers are still in vogue which necessitates the import of rubber. Both natural and synthetic rubber are obtained from Malaysia, Sri Lanka, Canada, France, Italy, Japan and Singapore. The total requirement of the battery industry would be 180 tonnes while the tyre and tube industry, which is well established, imports very much larger quantities.

Antimony

This raw material is imported from China, Belgium and Korea. The total requirement for the industry is about 150 tonnes.

Machinery

Companies that are in collaboration with Japanese manufacturers generally import their equipment from Japan. Similarly, Exide prefers to import equipment from the U.K. Despite this, companies are free to source equipment from anywhere in the world.

The engineering industry is now growing in Pakistan and is being supported by the Government through various incentives. This sector is likely to produce battery manufacturing equipment, which will reduce the incidence of imports.

Smelting facilities and recycling of lead

Except at one plant, smelting and recovery facilities for recycling of lead are not available in the country, but small operators do melt battery plates and recover lead. Fortunately, the usage of lead-calcium batteries is virtually non-existent and, therefore, there are no contamination problems with reclaimed antimonial lead.

Moulding of containers

At present, there are no battery makers involved with the moulding of plastic containers although most have their own container and lid moulds. The plastics industry in Pakistan is becoming more organized and it is considered desirable to farm out this operation to the specialists. On the other

hand, rubber containers are moulded in-house and two units have their own moulding facilities. Rubber containers for railway engines have been exported to India and Egypt in small quantities.

Battery manufacturing machinery

The battery manufacturers are also trying to make use of the growing engineering industry and have succeeded in getting simple equipment made within the country. This trend is likely to increase and, hopefully, battery makers will become self-sufficient in procuring machinery indigenously.

Labour

As a result of the established status of the battery industry in the country, particularly in Karachi where the three main battery plants have been set up and where other supporting industries are in existence, the problem of finding good operators and workers is minimal. Wages as compared to other industries are better, turnover is less, and productivity is reasonable.

Market and operating environments

As in other countries, the size of the battery market is mainly determined by the number of vehicles on the road. The vehicle park as per the Government Statistical Bureau (see Table 2) has increased at an average rate of 10% during the past decade. This trend is likely to continue as a result of growing affluence, the mechanization of agriculture, the improvement in transport systems and roads, and the competition with the railways.

Although the vehicle park is estimated to be 2.7 million in 1989, if two- and three-wheel motorcycles and other vehicles are ignored then the net car park would be only 804 000. Some tractors used in the agricultural industry are not registered. The latter amount to approximately 200 000, and therefore the car park for the purpose of battery requirements is 1 million. Since battery life in Pakistan is nearly 24 months, the annual requirement of batteries is about 500 000 per annum. In addition, the demand of batteries in the original equipment sector is approximately 75 000 units per annum, making a total requirement of 575 000 for the year 1988/89.

Market size and growth

The battery market is growing at the rate of 9% as witnessed by the following statistics:

TABLE 2
Vehicle population in Pakistan

Year	Motor cars, jeeps, and station wagons	Motor cabs and taxis	Buses	Trucks	Motorcycles (2 wheels)	Motorcycles (3 wheels)	Others	Total	Growth (%)
1980	262636	18951	50001	58654	508335	45906	165273	1109756	9
1981	282572	19571	51245	59553	548242	45329	183080	1189592	7
1982	304449	20715	51710	63021	636196	45525	217341	1338957	13
1983	339543	22889	53749	66966	709213	46281	246511	1485152	11
1984	382729	23176	58596	70338	790004	46841	287988	1659672	12
1985	428257	24720	62074	75655	879108	47101	323838	1840753	11
1986	474744	25419	73518	81019	946861	47669	369905	2019135	10
1987	514837	25998	76368	82527	1059379	47912	414442	2221463	10
1988 ^a	556023	26519	79423	84178	1186504	48391	464175	2445213	10
1989 ^a	606065	27315	83394	86703	1328884	48875	519876	2701112	10

^aFigures for these years are estimates.

1984/85	399 000	1987/88	530 000	1990/91	700 000
1985/86	444 000	1988/89	575 000		
1986/87	478 000	1989/90	641 000		

Share of the market

The estimated share of the market of each company is given in Table 3. It can be observed that the newcomers are gradually making inroads into the market to the detriment of the re-platers and illicit importers.

TABLE 3
Battery market in Pakistan

	% Share		
	1986 - 87	1987 - 88	1988 - 89
Exide	43.0	51.0	51.7
AGS	17.1	18.9	20.9
FB	0.5	6.8	10.4
Lucas	1.7	2.6	1.7
NBI	1.2	0.9	0.9
Foreign	22.4	9.4	6.0
Re-platers	10.7	9.4	7.5
Others	3.4	0.9	0.9

Original equipment

As stated earlier, the total off-take in the original equipment sector is approximately 75 000 units per annum. The breakdown of the estimated and expected production in this sector is given in Table 4.

Battery types used in the market

As 70 to 80% of the vehicles are of Japanese origin, most of the manufacturers are following the JIS specifications in making automotive batteries. One manufacturer has undertaken to go into G.S.M. technology and is making low-maintenance batteries. Nobody, however, has ventured into making sealed, maintenance-free or gas-recombination batteries in the country. The size range of the automotive batteries is from 24 to 200 A h. The smaller batteries for motorcycles are made on a cottage scale, or smuggled into the country, and are not generally being made by the organized sector despite the fact that a substantial growing market does exist.

TABLE 4
Original equipment market in Pakistan

Original equipment manufacturers	1986 - 87 (estimated)	1987 - 88 (estimated)	1988 - 89 (estimated)	1989 - 90 (expected)
AGTL Al-Ghazi tractor (Fiat)	10000	10000	9600	9600
MTL Millat tractors (Massey Ferguson)	12000	12000	10000	9600
ATL Allied tractor (Ford)	4800	4800	4800	4800
PECTO Belarus	4800	4800	4800	4800
IMT (Associated tractors)	1200	1200	1200	800
Sub total	32800	32800	30400	29600
NML (Bedford trucks)	2400	2400	2400	3000
GNL (Nissan truck)	4000	4000	4000	2400
HinoPak (Hino trucks and buses)	1000	1800	2400	3400
NDM (Suzuki Jeep)	2400	2400	2400	3000
SE (Mazda Coaster)	1800	1800	1800	600
Pak Suzuki (Suzuki cars, and vans)	20000	24000	30000	38400
Pak Suzuki (Swift car 1000 cc)	—	—	—	6000
NML (Isuzu truck)	800	1000	1200	1200
SE (Toyota Hiace)	800	800	600	600
Sub total	33200	38200	44800	58600
Grand total	66000	71000	75200	88200

Prices

Due to a 10% excise duty on the retail price plus 12.5% sales tax, as well as the burden of import duties on raw material and machinery (see Table 1), the prices of batteries are high. The prices of some types in the replacement sector, where dealers' discount is up to 20%, are shown in Table 5. In the

TABLE 5
Cost of batteries in Pakistan

Battery type	Capacity (C/20) (A h)	US \$ ^a	Battery type	Capacity (C/20) (A h)	US \$ ^a
NS40S	30	31.28	N70	70	61.28
NS40Z	34	35.14	6PA15	97	71.57
NS40ZA	34	35.14	N100	110	76.71
NS40ZL	36	39.42	3X29	200	79.71
6XNF9	62	48.42	6X23	155	134.57

^aUS \$ = Rs 21.00.

original equipment and Government sectors battery sales are direct and, since no dealers offer discounts, the prices are lower.

Principal battery manufacturers

Details of the principal battery manufacturers are listed in Table 6.

TABLE 6
Major battery companies in Pakistan

	Exide	AGS	ABC	Lucas ^a
Equity	Rs 24 m	Rs 20 m	Rs 30 m	
Date of establishment	1953	1964	1987	1971
Capacity	300000	200000	150000	30000
Brand name	Exide	AGS	FB	Lucas
Location	Karachi	Karachi	Hub Chowk	Karachi
Foreign participation	55%	10%	15%	100%
Technical support	Chloride U.K.	GS Japan	FB Japan	Lucas U.K.

^aThe Lucas Company existed from 1952 but only commenced battery operation in Karachi in 1971.

Distribution

The manufacturers normally sell their batteries through distributors/main dealers. The distributors sell to retailers allowing them up to 14% discount. While the distributors sell only one brand of battery, the retailers sell a mixture of nearly all brands and rarely have a brand loyalty. The retailers also indulge in re-plating and some have no scruples in selling smuggled batteries. The systems of guarantees and warranty are variable, but generally the dealers are responsible for providing after-sales service, monitoring product quality, and liaising with manufacturers for settlement of claims.

Industrial

The Telephone Department, the Water and Power Development Authority and the Railways require varying types of industrial batteries, but the total demand is not sufficient to justify the setting up of a new factory. The existing manufacturers do make some flat pasted (Fauré-X) cells for the Telephone Department and the Water and Power Development Authority. The country is self sufficient in making diesel engine starting batteries, particularly for the Pakistan Railways.

The Government is keen to have facilities for the manufacture of certain types of batteries, particularly for defence needs. The demand in the sector, however, again does not justify the establishment of plants for manufacturing sealed batteries, either maintenance-free or gas-recombination types.

The demand for traction batteries is very small and is met by importing mostly tubular-plate batteries for which manufacturing facilities do not exist in the country.

Future trends

The growing demand for automotive batteries has attracted investors. As a result, a number of applications for setting up new plants have either been sanctioned or are awaiting Government approval. Those who have already obtained approval are waiting to assess the need and the market condition.

Once new factories have been installed, there is likely to be fierce competition to gain a better and larger share of the market. It is likely that the excess capacity thus created may be utilized for exports to neighbouring countries such as Afghanistan, Iran, Iraq and the Middle Eastern oil-rich states. Anticipating a recycle of economic boom, however, there are moves to establish battery plants in Saudi Arabia, Bahrain and Yemen and to expand existing facilities.

The Government of Pakistan has started taking steps to utilize solar energy, and the introduction of computers has opened new avenues for standby batteries for photovoltaic cells and uninterrupted power supplies. These potential markets will be explored in the future.

Conclusions

The battery industry in Pakistan is still in its infancy and has to go a long way to attain maturity. The potential for future growth in new fields is substantial, although at present the demand does not necessarily justify the installation of new plants. Nevertheless, the existing plants require modernization, expansion and acquisition of new technology.