

مولدات الكهرباء التي تعمل بالديزل في دولة الإمارات

### **Diesel Electricity Generator Sets in U.A.E.**

With increasing demand, the electricity industry in U.A.E. has been growing consistently each successive year. The U.A.E. economy has not only seen increased production and installed capacity, but also structural changes and technological improvements. Given the abundance of resources natural oil and gas, U.A.E. is a natural producer of electricity. However, distribution certainly remains a challenge where electricity has to be carried to each remote corner of the country. This is true for any country with large rural areas home to some isolated inhabitation – all of which are not easily brought under a common grid. Consequently, there is demand for generating electricity outside the main distribution grid.

Diesel usage for producing electricity in U.A.E. - Electricity in U.A.E. (and in the entire Gulf region) is overwhelmingly produced from gas. There are no hydro or nuclear plants in the entire region. Almost 97% of the production reportedly uses gas, and the remaining 3% is produced by generation sets run by diesel or steam turbines. Associate gas, by virtue of being a by-product of crude oil, provides a virtually free source of electricity production. However, there is difficulty in transporting gas. Diesel is a far more costly source of producing electricity, but is the obvious choice for smaller auxiliary requirements of electricity generation because of the portability of the fuel. There are several plants in the northern areas of U.A.E. which have to rely on diesel as a raw material because of lack of easy availability of gas.

Meeting electricity demand – Gas is not easily available in the northern Emirates, and consequently production of electricity in these areas is highly dependent on diesel fuel. Almost an estimated 75% of the electricity production in the northern Emirates is from diesel oil. The areas in U.A.E.'s west are more easily connected on a common grid for electricity transmission as these are closer to the large electricity production units in Abu Dhabi. However, the need for diesel electricity generators comes not only from electric companies for further distribution, but there is also a large consumer demand for locations or situations viewed to be in an “island” mode, namely those cannot be temporarily or permanently connected to a fixed grid, e.g. ships, mobile homes, isolated rural locations and land under fresh development etc.

Diesel electricity generators sets in U.A.E. – Small portable diesel generators range from about 1 KVA to 10 KVA may be used as power supplies on construction sites, or as auxiliary power for vehicles such as mobile homes, camping etc. While the larger industrial generators can range from 8 to 30 KVA, the smaller ones are portable and be used in multi-locations. Sizes up to 5 Megawatts are used for small power stations, which may use multiple units anywhere from one to twenty units. Diesel generators demand in U.A.E. is for sets with compression-ignition internal combustion piston engines, which could be either diesel or semi-diesel engines.

Demand for Electricity Generators in U.A.E., Net Imports 2003-08, Millions AED

Year	Imports	Re-exports	Net Imports	Annual Growth
2003	498.3	124.9	373.4	-
2004	447.3	97.9	349.4	-7%
2005	724.4	188.0	536.4	54%
2006	875.1	176.2	698.9	30%
2007	1,277.2	211.3	1,065.9	53%
2008*	1,870.2	378.0	1,492.2	40%

Source: U.A.E. Trade Statistics \* Dubai figures plus estimates for Abu Dhabi & Sharjah

Demand – Demand for diesel electricity generators comes from several sources. The small capacity units are widely used for emergency power as backups. However, many also have a secondary function of feeding power to utility grids during peak periods or when there is a shortage of large power generators. Demand from ships is particularly significant to provide electricity not only for on-board electric appliance and gadgets but sometimes also for the main propulsion. The U.A.E. is a major regional market for maritime equipment, and diesel electricity generators find a substantial demand.

Furthermore, diesel generators are in demand at construction sites which may not yet have a connection to the grid or may have a heavy temporary load requirement during the construction period. Besides this, there is also demand for smaller units for recreational purposes e.g. for camping in remote areas.

Accelerating growth in demand – Since there is no domestic production yet, net import figures (imports minus re-exports) very accurately reflect the demand. Demand for diesel generator sets has distinctly accelerated in recent years. For instance, it has more than doubled in the two years between 2006 and 2008. In 2008, demand grew by an impressive 40%. Demand has been growing at an average rate of 32% per year since 2003.

Imports - Currently, the entire requirement of diesel electricity generators is met through imports. The exporting countries are predominantly Western countries, viz. U.S.A., the key EU countries (U.K., Germany, Spain, Italy and France) and Japan. However, China and India have also been able to penetrate the market in recent years, and count among the top 10 exporters of diesel electricity generators. The manufacture of generator sets has now started in the AGCC region, and recently some GCC brands have also penetrated the market.

Structure of demand – There is considerable market differentiation and an inverse relation between size and value of generator demand. While in numbers, the largest demand is for small generators (defined as less than 75 KVA by the Dubai Customs Department), forming about 71% of demand, their share in value is a mere 15%. Large generators (with more than 375 KVA power), constitute virtually half of the demand value despite a mere 7% share in units. Even the medium sized generators have a greater share in value than in units.

Demand for Electricity Generators by capacity, Dubai, Net Imports 2008

Capacity	Units	% Share	Value Mn. AED	% Share
Less than 75 KVA	19,471	71%	186,604	15%
75 -375 KVA	6,046	22%	461,932	37%
More than 375 KVA	1,806	7%	591,323	48%
Total	27,323	100%	1,239,859	100%

Source: Dubai Customs Department

Re-exports of Electricity Generators by capacity, Dubai, 2008

Capacity	Units	% Share	Value Mn. AED	% Share
Less than 75 KVA	36,533	91%	69,708	21%
75 -375 KVA	3,146	8%	140,545	41%
More than 375 KVA	397	1%	128,389	38%
Total	40,076	100%	338,642	100%

Source: Dubai Customs Department

Re-exports - Almost 52% of the imported electricity generators (in units) are destined for re-exports. Re-exports are overwhelmingly of the smaller capacity generators, in units more than 90% of the re-exports business, though their share in value is a mere 21%. This is understandable as the small generators are demanded by retail consumers (households and offices), whereas the larger generators are meant for industrial/communal use, applied by electricity companies for production and distribution of electricity to consumers over a grid. The latter are consequently larger units which are imported directly from the manufacturers.

Suitability for SME manufacturing – Given the large demand for diesel electricity generator sets not only in U.A.E., but in the wider region extending from Iran, Iraq to Northern and Eastern Africa, there is potential for domestic manufacturing. The lead to manufacturing can be initiated by assembling such units, to be followed by component manufacture as well. Assembly production means that diesel generators are well suited to small and medium enterprises. This obviously refers to the small sized units.

Outlook – For the purpose of setting up a new business for the domestic assembly and manufacture of portable diesel electricity generator sets, it would be appropriate to consider its market potential and viability using both domestic and re-export demand. For the smaller units, there is a higher re-export than domestic demand, which has been growing robustly. There is every indication of strong demand in the country and the region, and the two together could make domestic production viable.