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*By Gerald Parkinson, CEO Parkinson Associates, authors of the GenStat database*

We live and work in a world today that appears to be getting smaller. Communications are now much faster, technology advances occur more rapidly, and markets have become more demanding. Unless we keep pace with these changes, we are in danger of being left behind.

And yet, it's not just about keeping pace with these changes that matters, but how to get ahead of them and, on occasion, to be the catalyst for change ourselves. Unless we have good knowledge about the marketplaces in which we operate, we will find ourselves at a competitive disadvantage. So, to use a military expression "time spent in reconnaissance is never wasted," let's examine the marketplace and see how we can keep abreast of some of the factors affecting it.

*"Time spent in reconnaissance is never wasted."*

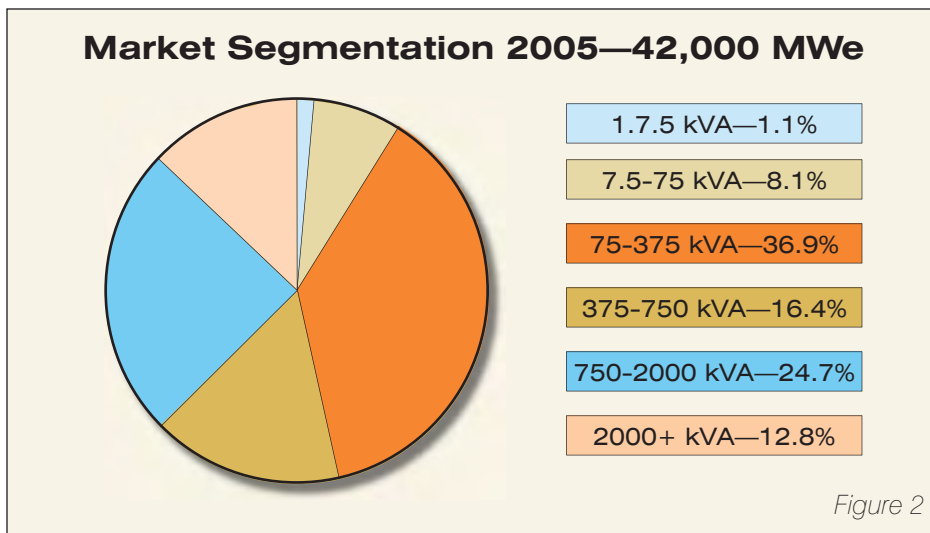
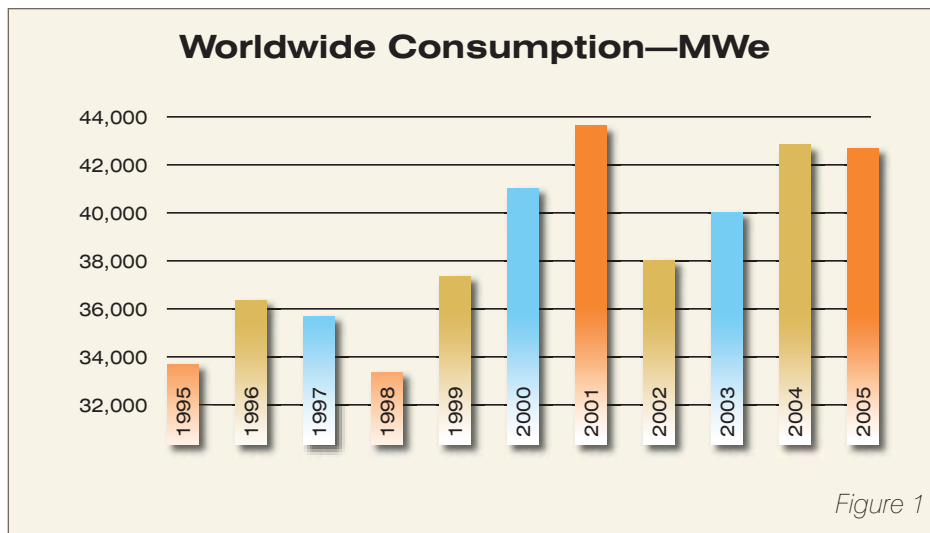
#### How should we measure it?

On-Site Power professionals are in the business of producing, selling, distributing and installing prime and standby electrical power for consumers in the industrial, commercial and domestic sectors, a market that is measured in terms of installed generating capacity, load factor and kilowatt-hours consumed.

The only way we can assess that market is to first measure its volume (i.e., numbers of units in a series of representative power bands) and then converting that figure into electrical kilowatts (KWe).

For example, it's vaguely helpful to know that Nigeria consumed 8,500 generators in 2004; better still to know that 5,200 were below 75 kVA, 3,000 were from 75-750 kVA and the balance above 750 kVA—and that this can be broken down even further. But it is much more relevant to know that the 5,200 units below 75 kVA only represented 15% of the total business in KWe output, while the 3,000 units between 75-750 kVA represented 60% of the demand, for that is where the revenue was.

So, it is always best to work first in numbers of units (a minimum of 6-bands), then to convert these to KWe or MWe before valuing them. There is, however, a much more important reason for working in MWe, for there are distinct relation-



ships between the annual growth rate of the consumption of electricity measured in millions of KWh and the annual demand for diesel- and gas-engine driven generating sets; as there are also for the net annual increase in global generating capacity for major power plant added each year to the system in any given market or region.

During the past 10 years, the global consumption of electricity has been growing at 3% per year and installed generating capacity at a rate of 2.6% per year.

#### How big is the market today?

In 2004, the global market consumed 400,500 generating sets. These had an aggregate generating capacity of 42,700 MWe, and the total market was worth somewhere in the region of US\$7 billion dollars at factory door prices.

A more recent estimate, completed in January this year, indicates that the market in 2005 declined by about 1.5%. A final assessment won't be available until

August 2006, but initial indications are that volume was in the range of 385,000-390,000 units with a total generating capacity of 42,000 MWe. Figure 1 shows that, in value terms, the market has not changed significantly from 2004.

#### How is the market by range?

Figure 2 shows how the market was segmented in 2005.

- **Less than 7.5 kVA:** Global demand for units below 7.5 kVA continues to decline at a rate of about 2% per year. Over the past decade, volume has dropped from 150,000 to 112,000 annually and now represents only 1% of megawatt demand. Since the vast majority of these sets are now produced (and consumed) in Southeast Asia, don't be surprised when China—and possibly India—becomes the future supply source for these small units. By 2020 demand could be as low as 80,000 units per year and continuing to fall. In the UK, we now only produce about 1,000 units per year.

## Worldwide Forecast—MWe

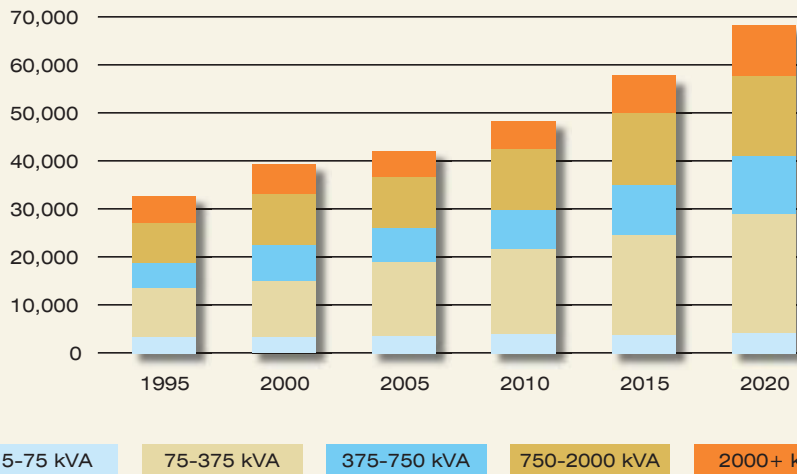


Figure 3

During the past 10 years, global consumption has been growing at 3% per year.

- **7.6-75 kVA:** By comparison, the demand for sets in this range has increased at the rather marginal compound annual growth (CAG) rate of 1.5%. 138,000 sets were purchased in 2005. It is unlikely that this segment of the market will grow any faster, so by 2020 the market is not likely to exceed 170,000 sets. Even so, it represents 8% of total demand.
- **76-375 kVA:** The 75-375 kVA band, and the band above, are probably the two most interesting growth areas. In the past 10 years demand has increased at 3% CAG, from 80,000 to 106,000 units globally, and should increase by another 60,000 units over the next 15 years. Sets in this range represent the single largest segment of the business, 15,500 MWe last year – 37% of total demand.
- **376-750 kVA:** Generating sets in this range have been growing at an even faster rate—3.65% CAG. We believe that this growth rate is likely to continue, so that by 2020 demand will have risen from 17,000 units annually to almost 30,000. With an aggregate generating capacity just under 7,000 MWe last year, 16% of the total, these sets, together with the range below represent over 50% of market demand.
- **751-2,000 kVA:** Sets above 750 and less than 2,000 kVA have also shown good growth—about 3.3% p.a. over the past decade—but demand has been cyclical; for example, a massive boost in the years of the threatened millennium bug, a bug which failed to become pandemic! Even so, they represent 25% of global demand—10,400 MWe. Last year, 12,000 sets were sold. That could possibly grow to 19,000 by the year 2020.
- **2,001+ kVA:** Generating equipment above 2,000 kVA represents 13 % of MWe demand. The unit level is, however, small—just over 2,000 sets last year—but the market is growing annually at a rate of around 3%.

If we ignore future demographics and economic forecasts, then—based on past performance—the scenario by 2020 could look like Figure 3.

### How was the market by region?

Figure 4 shows the largest regional



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Global generating capacity at the end of 2004 was in the order of 3,750 GWe.

generating set market in 2005 (when the overall market consumed 42,000 MWe) was the Far East with a 28.8% share. Europe was the second largest with a 26.8% share. Western Europe alone was 22.2%—just one percentage point ahead of North America (21.2%).

The Middle East was 11.8%; Africa 6.7%. By comparison, the smallest regional market was Latin America—comprised of Central America, South America and the Caribbean—at 4.7%.

Apart from the millennium surge in demand, the most dramatic market change in the past decade was the decline in Far East business during the Asian economic recession (1998-2000). However, in the past two years, growth in this region has been returning rapidly. Both Africa and the Middle East have grown by proportion, particularly the latter, from 4 to 12% in the last 10 years, whereas Europe and

the Americas have maintained a large, but static, share of the market.

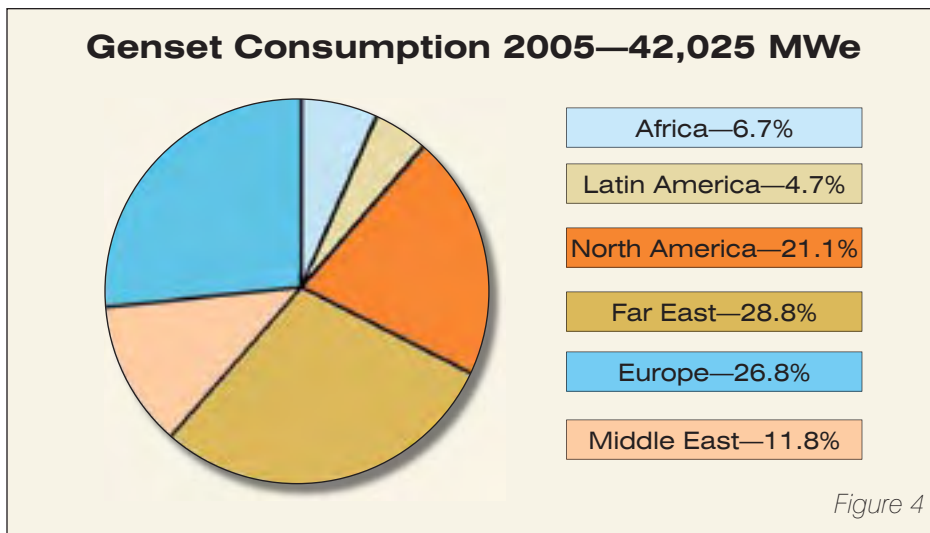
#### Future market indicators

At the end of 2004, global generating capacity was in the order of 3,750 GWe (3.75 million MWe). Over the last 10 years, this has increased at a net rate of around 95,000 MWe each year. In recent years, the average has been nearer to 115,000 MWe annually; a compound

growth rate of 2.5% per year.

Over the next few years, some regions of the world will grow at a faster rate because of the way in which demand is outstripping supply, especially in China and other fast-growing Asian economies.

The actual net installed capacity increase during the past 20 years has been just over 50%, during which time the global population has increased by one-third. The fastest rate of growth during



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## Worldwide Consumption—MWe

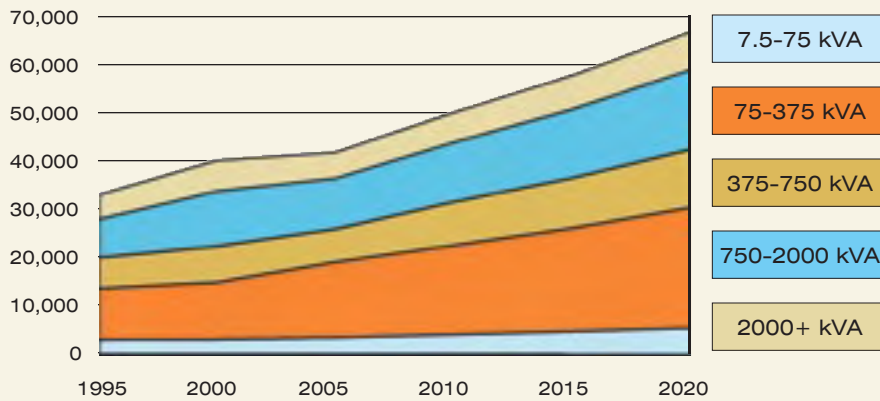


Figure 5

this period has been in the developed world (i.e., in the OECD countries), but the emphasis has now shifted to Asia thanks to demographics (e.g., in Europe we have both a declining and aging population).

Against this background, the global generating set industry has been producing an average of 37,000 MWe per year for the past 10 years (42,000 MWe in

2004). That's almost 40% of the net annual increase in large-scale power plant capacity. And if we consider only generating sets above 500 kVA, it is still around 20%.

So there are global market indicators that On-Site Power professionals can follow globally: the growth in electricity consumption by region (preferably by market); and the net increase in major power

plant installations; and economic indicators such as GDP, population growth, etc. Alternatively, you can subscribe to recognized databases that monitor the world's generating set markets.

In today's emerging economies, there are about 1.5 billion people have no access to electricity. In fact, 45% of India's households don't have such access.

Today 20% of the world's population consumes almost two-thirds of its electricity. They represent the developed/mature markets. Conversely, Africa and Asia—two-thirds of the world's population of 6.5 billion people—consume only 20% of the world's electricity.

North America's residential sector consumes 24 times more electricity than its counterpart in China, 29 times more than India. Consumption in Western Europe, on the other hand, is only about half of that (about 15 times more than in Africa). These rates could change under the influences of shifting demographics, political will and finance.

Years ago, the thought was that, as a country developed its infrastructure and

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installed new generating plants and transmission lines, that the demand for prime and stand-by diesel power plants would diminish. Nothing could have been more wrong. As electricity becomes available to industry, commerce, and the masses, so the need for “backing-up” the continuity of supply becomes ever more essential.

**Is the market growing?**

It is anticipated that world net electricity consumption will nearly double over the next 25 years. Between now and 2025, world electricity demand is projected to grow at an average rate of 2.6% per year to somewhere in the order of 26,000 billion KWh annually. However, 59% of this growth will occur in the emerging economies. “Mature markets” will account for only 28% and “transitional” economies for 14%.

By definition, mature markets include Western Europe, North America, Mexico, Japan and Australasia. In effect, all of the OECD countries. Emerging economies include India, China and others within Asia such as South Korea, Malaysia, Thailand and more; Africa, the Middle East and Central and South America. Transitional

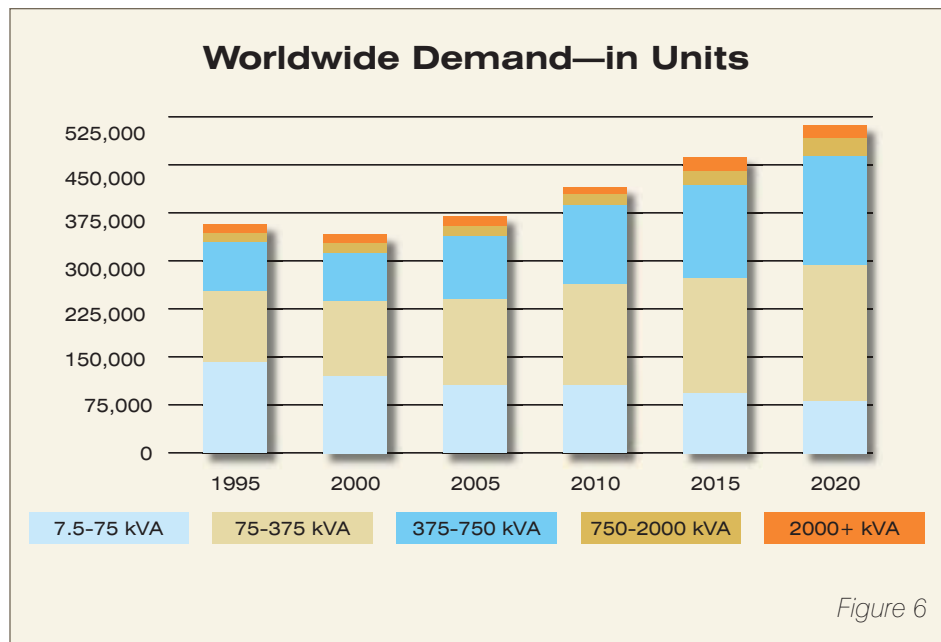


Figure 6

markets include Eastern Europe and the former Soviet Union.

Demand for electricity will grow most rapidly among the world’s emerging economies at an average rate of about 4%. But demand is not likely to grow more than 1.5% annually in the mature markets. For those “in between” (i.e., the former

Soviet Bloc countries), the rate will probably be in the order of 3.0%. On a strict quantity basis, China and the U.S. will lead the growth stakes.

In order to meet the world’s projected electricity demand from 2004 until 2025, worldwide installed generating capacity is expected to grow from 3750 GWe



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## Genset Consumption 2020—67,000 MWe

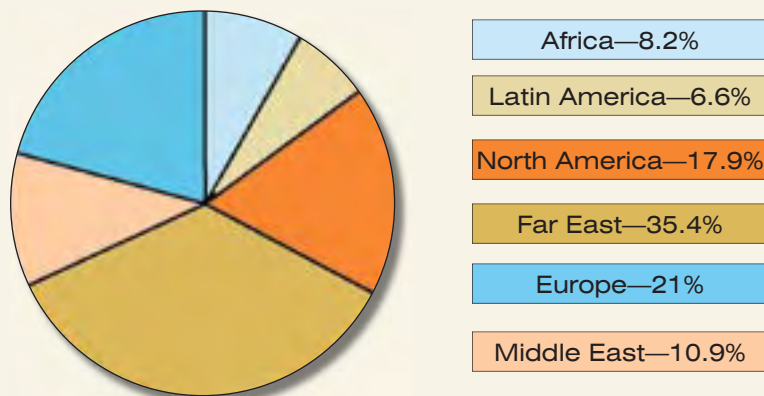


Figure 7

in 2005 to 5,500 GWe, an increase of 1,750 GWe (i.e., an annual growth rate of 2.5%). As load factors have also been steadily increasing, we can expect overall consumption of electricity to grow at the slightly faster rate of 2.6% per year between now and 2025.

Against this background we have been monitoring generating set demand for the past 15 years and can report that, overall, it has been growing at a compound annual

growth rate of 2.8%.

If we apply a similar growth pattern to today's consumption of 42,000 MWe, we could expect an annual demand of 68,000 MWe by 2020.

However, if we apply the different growth rates of the emerging and mature markets, we arrive at a slightly lower demand of 67,000 MWe by 2020. As Figure 5 shows, the tendency is to shift the emphasis of demand by about 3 percentage

points toward those generating sets that have an electrical output of less than 375 kVA.

Several factors could change this outcome. Under the right economic conditions, Africa, Central America and the Middle East could grow at a slightly faster rate, just as North America and Western Europe could. As a result, the compound annual growth rate could rise to as much as 3.4% as opposed to today's annual rate of 2.8%. However, in the short term, we prefer to stay with the lower forecast level of 2.8%. As Figure 6 shows, this means that the market is likely to consume 540,000 units by 2020. As Figure 7 illustrates, the Far East's share of the global market will likely have grown to 35% while North America and Europe drop to 18% and 21%, respectively. ■

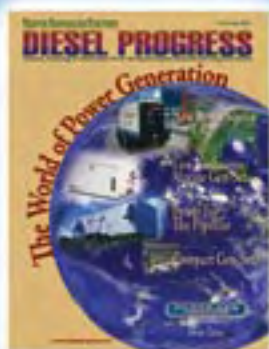
### About the Author

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