4. Regional Demand

North America and Europe represent almost equal shares of the market, each accounting for 31% of the total. However, neither region will be a source of growth as initial system sales decline while aftermarket and service hold steady. Nevertheless, these regions account for almost two-thirds of the market and are a source of replacement sales. Eastern Europe is the only growth opportunity. All the emerging markets are experiencing good growth, and this will be where most suppliers will be focusing their attention.

Figure XII-11: AA Demand by Region

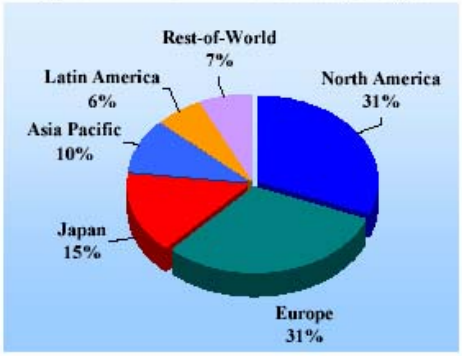


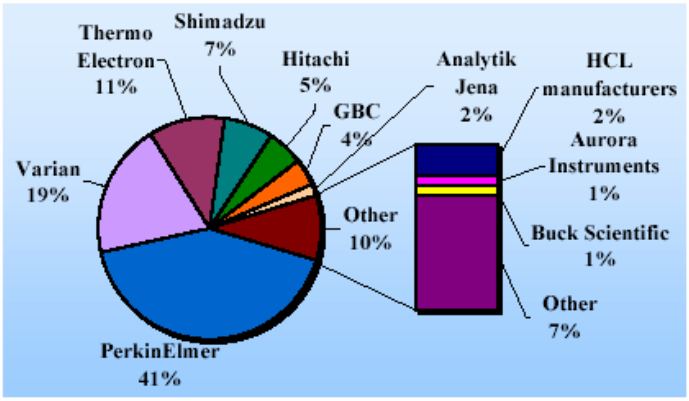
Table XII-4: AA Demand by Region

	2003		2004		2005		2008		'03-'08
	$ Mil	Percent	$ Mil	Percent	$ Mil	Percent	$ Mil	Percent	CGR
North America	116	31%	117	31%	117	30%	110	27%	-1.0%
Europe	118	31%	116	30%	116	30%	120	29%	0.4%
Japan	56	15%	57	15%	58	15%	64	16%	2.5%
Asia Pacific	38	10%	40	11%	43	11%	55	13%	7.8%
Latin America	23	6%	24	6%	25	6%	28	7%	4.7%
Rest-of-World	26	7%	27	7%	28	7%	31	7%	3.0%
Total	**376**	**100%**	**381**	**100%**	**387**	**100%**	**408**	**100%**	**1.6%**

5. Competitive Situation

Two main competitors dominate the AA market, PerkinElmer and Varian. PerkinElmer is by far the larger, with an estimated 41% market share. Varian is roughly half that size, with 19% market share. Not only do these two companies account for most of the new initial system sales, but they both also manufacture their own hollow cathode lamps, and other aftermarket items. Basically, all HCLs manufactured today conform to either the PerkinElmer or Varian lamp designs. Consequently, both manufacturers reap a great deal of benefit from having set the standard.

Figure XII-12: AA Vendor Market Share



Thermo Electron holds the number three position, and the Thermo Elemental SolAAr series of instruments combine technical improvements with stylish design. Shimadzu released its 6300 AA model last year, and is trying to get better market penetration outside the Japanese market.

In the next tier of vendors are Hitachi, GBC Scientific and Analytik Jena. Analytik Jena had a rather poor year in 2003, despite excellent growth in recent years. The high euro and the lack of German spending are largely to blame.

Manufacturers of HCLs form the next largest contribution to the market. The total market for HCLs is in excess of the amount shown in the vendor share, but much of it is hidden within the sales of instrument manufacturers. However, some companies (e.g. Photron and Cathodeon) only participate in this market through their involvement in the manufacture of lamps. Smaller competitors in the AA market include Aurora Instruments, Buck Scientific, Lumex, SAFAS and Beijing Rayleigh Analytical, which is important in the Chinese market.

Table XII-5: AA Vendor Participation

Vendor	Flame	Graphite Furnace	Aftermarket
Analytik Jena			
Aurora Instruments			
Beijing Rayleigh			
Buck Scientific			
GBC			
HCL manufacturers			
Hitachi			
Lumex			
PerkinElmer			
SAFAS			
Shimadzu			
Thermo Electron			
Varian			

Key: Major Involvement; Moderate Involvement; Minor Involvement

6. Recent Developments

Table XII-6: AA – Recent Events 2003-2004

Date	Company	Development
Feb-04	Leeman Labs, Teledyne	Teledyne acquired Leeman Labs, which has become part of Teledyne's instrumentation division.
Feb-04	Cathodeon, Heraeus Noblelight	Heraeus Noblelight acquired Cathodeon, a maker of Hollow Cathode Lamps (HCL).
Mar-04	Leeman Labs, Hitachi	Leeman Labs (Teledyne) and Hitachi entered into a distribution deal, with Leeman offering Hitachi's AA spectrometers to complement its own products.

7. Future Prospects

High performance, multi-element graphite furnace instruments will impact the ICP market more and more. Flame AA will remain ubiquitous in the lab, but no significant technical advancement can be expected for these instruments; consequently, sales of flame AA are expected to decline in the coming years, except in the developing countries. Vendors will largely focus on speed of analysis, light sources and automation.