
GLOBAL ELECTRONICS INFORMATION NEWSLETTER

Number 14

September, 1981

MORE THAN A NEWSLETTER

The **Global Electronics Information Newsletter** is an instrument of PSC's Global Electronics Information Project. It includes regular summaries of important news from the high technology electronics industry, but it is meant to do much more.

First, the **Newsletter** updates PSC's 1981 pamphlet, "Delicate Bonds: The Global Semiconductor Industry." This pamphlet, still available for US\$2.00 via surface mail, provided comprehensive background on the growth of the semiconductor industry and its global division of labor. The **Newsletter** provides new data - and more important - it discusses new trends in the industry.

Second, the **Newsletter** is designed to give readers a taste of the materials constantly being added to PSC's extensive files on the electronics industry. Articles cited in the **Newsletter**, plus many others from the same sources, can be copied from PSC's files. Correspondents can either request specific articles or request an estimate for research and copying costs for a file search on a specific subject.

In fact, PSC's file collections are much broader than electronics production. The Cen-

ter is preparing, for general distribution, a complete catalog of its file headings.

Third, PSC is using the **Newsletter** to develop an international network of scholars, journalists, activists, and others concerned about the implications of the spread of the semiconductor and related industries. The **Newsletter** not only allows us to maintain contacts with a larger number of correspondents than we could write individually each month, but it provides an opportunity for correspondents to publicize their publications and projects directly to others in the field.

The **Newsletter** and related activities represent only a portion of PSC's study of the electronic industry. The Center is seeking funds for a pamphlet on the military uses of the chip; PSC staff are negotiating for a book contract on the dangerous uses of the chip. The Center frequently consults with scholars, journalists, and union organizers on all aspects of the industry's development. From its unique vista in the heart of Silicon Valley, PSC attempts to offer critical analysis of an industry whose importance is well covered by the mass media, but whose shortcomings are ignored.

MILITARY CHIPS

Though the U.S. military – particularly the Signal Corps and the Minuteman missile program – played a key role in the development of both the transistor and integrated circuit, in recent years the civilian sector has taken the lead. Chip-based electronics games have surpassed military simulation program by so much that the Army has been trying to hire away game programmers. More important, the Pentagon's VHSIC (Very High Speed Integrated Circuit) program has been designed not only to spur advanced research, but to establish a working relationship between chip-makers, military electronics contractors, and the military itself.

Still, the military market for semiconductors greatly exceeds the small "mil-spec" market – that is, the sale of chips which meet tight military specifications. Market analyst Data Resources Inc., adding the purchases by military contractors to direct military procurement, places the Pentagon share of U.S. semiconductor production at 18%. Data Resources also projects a military share of up to 23% in 1986, as civilian expansion flattens while the Pentagon undertakes massive new, electronics-using weapons systems such as the MX missile and B-1 bomber. (*San Francisco Examiner & Chronicle*, September 13, 1981)

CHINESE TRAINING

Ulvac, a producer of semiconductor manufacturing equipment and vacuum devices, has contracted with the Academy of Sciences of the Peoples Republic of China to provide training to Chinese graduate students in microprocessor-based industrial control systems. Starting with five, and eventually expanding to 100 trainees, Ulvac will provide two-years training at Chinese expense and three years of paid employment. (*Semiconductor International*, August, 1981)

TOXIC ELECTRONICS

The production of semiconductor wafers, from which chips are made, and printed circuit boards, into which finished chips are stuffed, uses a wide range of toxic chemicals and generates a surprisingly large amount of toxic wastes. In early September, for instance, a truck carrying acid and heavy metal wastes from a Silicon Valley electronics firm – Varian Associates – sprung a leak on Interstate 680. Thousands of schoolchildren and residents had to be evacuated while the spill was cleaned up.

For more information on the environmental hazards of electronics production in Silicon Valley, see PSC staff members John Markoff and Lenny Siegel's article, "The Hazards of High Tech," in the July-August, 1981 issue of *Environmental Action*.

WAFER FAB COSTS

I.C.E. (Integrated Circuit Engineering), a leading industry consulting group based in Scottsdale, Arizona, presented a generalized cost analysis of wafer fabrication in its September, 1981 *I.C.E. Newsletter*. The average per wafer cost of producing a four-inch MOS wafer is \$80 to \$90, with an additional \$7 to \$15 for testing. Direct labor represents about 1.0 to 1.5 hours. Energy consumption, per wafer produced, averages 25 to 35 kwh. Each wafer requires 50 to 100 gallons of de-ionized water and about 0.2 gallons of acids and solvents. In addition, fabrication requires 1.2 sq. ft. of production space per wafer start per month.

PHILIPPINE E.P.Z.

The Philippine government has announced plans to construct a fourth export processing zone in Rosario, Cavite, just south of Manila. The zone, initially encompassing 74 hectares, is expected to host companies employing as many as 18,000 workers.

BARBADOS

The Industrial Development Corporation of Barbados is responsible for recruiting foreign investors to that Caribbean island nation. Its 1980 brochure highlights the literate, English-speaking workforce, relatively short distance from the U.S., and the usual package of infrastructure and trade and tax incentives. The IDC reports that the direct labor cost per month for an electronics assembler starts at US\$120 to \$145, and that the average wage ranges from US\$155 to \$215.

The IDC lists seven "successful" electronics companies now exporting from Barbados: Aviation Instrument Manufacturing; Thompson CSF; TRW; Intel; Vernitron; Microdata; and Thorn. It also compares Barbados production costs with Asian sites: "Total costs of assembly in Barbados are generally comparable to a similar plant in the export assembly areas of Asia. Exact ratios will vary with the Asian location (Singapore and Hong Kong are relatively more expensive; The Philippines and Indonesia relatively less). Depending on the product and process, Barbados can be very economical."

VIRGIN ISLANDS

Like its Caribbean Island neighbors, the U.S. territory of the Virgin Islands has begun a program to entice investments by multinational electronics companies. The territory offers significant tax advantages and political stability, but it has suffered interruptions in the delivery of water and power. More important, wages are "similar to those on the U.S. mainland."

Only one electronics company, Transducer Technology, has set up shop on the islands, and it only came to the Virgin Islands when its Puerto Rico tax exemption expired. (Electronics News, August 31, 1981)

SUPPLIERS

C.H. Kline & Co. has released a survey summarizing the \$2.020 billion market for chemicals and materials in the production of semiconductors and printed wiring boards. Substrates, packaging materials, and plating materials made up the largest category by value, at \$1.325 billion. Photoresists, acids and etchants, and atmospheric gases (nitrogen and oxygen) accounted for the largest category by weight (3.230 billion pounds) but sold for a total of \$335 million. The survey identified more than 130 separate suppliers, none of which held more than seven percent of the total market. (Electronics News, September 7, 1981)

WACKER SHUTDOWN

Semiconductor-grade silicon producer Wacker Siltronic (see August, 1981 Newsletter) will close its Portland, Oregon plant for fifteen work days during three separate periods this fall. Seven hundred workers - the entire staff except the sales force - will be idled. Wacker's major competitors cut back production earlier this year in response to the industry slowdown. Monsanto laid off 161 production workers and Siltec halted production for four weeks. (Electronics News, September 14, 1981)

SMIEL

Smiel, the silicon producer acquired by Dynamit Nobel last year, is expanding capacity at its Merano, Italy plant. However, it has dropped plans to build a polysilicon plant in the U.S. Electronics News (September 7, 1981) reports that Smiel still seeks single-crystal silicon capacity in the U.S., saying "The company would neither confirm nor deny reports that it was in negotiations to acquire Siltec Corp., Menlo Park, Calif."

N.C.R. FROM HONG KONG

After operating its Aberdeen, Hong Kong plant for eleven years, NCR (formerly National Cash Register) has decided to close its doors. *Asia Monitor* (Second Quarter, 1981) says the company blamed "uncompetitiveness, and a lack of planning and follow-up investment." Workers at the plant staged a sit-in to protest what they considered inadequate severance payments.

APPLE PICKS SINGAPORE

Apple, the Silicon Valley-based manufacturer of microcomputers, has announced plans for its first offshore assembly operation, in Singapore. Initially, Apple will assemble printed circuit boards at a rented facility at the Ang No Kio Industrial Park, but it plans to eventually assemble complete units at its own 10,000 sq. meter plant in the same area. (*Asia Monitor*, Second Quarter, 1981; *Far Eastern Economic Review*, August 28, 1981)

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