GLOBAL ELECTRONICS

Issue No. 104 September, 1990

C.B.O. LOOKS AT GOVERNMENT-BACKED CONSORTIA

In response to growing support in Washington for high-tech research, development, and manufacturing consortia, the Congressional Budget Office has conducted an independent review of Sematech and other, similar proposed institutions. CBO finds that Federally-subsidized consortia can support commercial innovation, but it suggests that the conditions which merit such an approach are limited. (**Using R&D Consortia for Commercial Innovation: SEMATECH, X-Ray Lithography, and High-Resolution Systems**, July, 1990)

Sematech's Limited Success

Sematech, the industry-organized semiconductor manufacturing technology consortium, is widely viewed as a model that other consortia should emulate, but it is too soon to know whether it will achieve its precise goals—such as developing and disseminating techniques capable of reproducing 0.5-micron features on silicon wafers by 1991.

CBO compliments Sematech's successful rapid construction of a 0.8-micron wafer fabrication plant. However, it concludes, "Much of this information [generated in the plant preparation]... is simply not usable by U.S.-owned firms. Some Sematech members are not at 0.8 micron manufacturing; by the time they reach this level, the current practice will be obsolete. In other instances, Sematech members that do use 0.8 micron processes are committed to different techniques. For example, Texas Instruments is building a new semiconductor memory plant in Italy. The memory manufacturing techniques used by Texas Instruments, however, were developed largely in Japan and are based on Japanese equipment."

CBO finds that Sematech's greatest success is structural, not technological. It writes, "Sematech's principal contribution so far has been to strengthen the lines of communications between producers and users of semiconductor manufacturing equipment."

Still, CBO questions the recommendation of the National Advisory Committee on Semiconductors (NACS), which proposed that the government boost Sematech's subsidy by 50% and extend the life of its support. CBO says that NACS did little to explain or justify the proposed funding boost.

HDTV: Less Than Meets The Eye

CBO is particularly skeptical of proposals to underwrite the development of high-resolution display systems, including widely publicized proposals for a government-backed joint venture to produce high-definition television receivers. CBO argues that trade associations promoting such projects have exaggerated the market for HDTV and have overstated the impact of HDTV on the electronics industry as a whole. CBO agrees with what to us is an obvious conclusion: "according to the American Electronics Association analysis, success in the HDTV market will determine success in the much larger personal computer market. Given the higher growth of the personal computer market and the greater technical sophistication, this result is unlikely."

Furthermore, CBO says that receivers for HDTV—that is, home television sets—will be produced in the U.S. whether U.S. or foreign-owned firms dominate the market. It observes, "Television receivers are produced in the United States primarily because of the bulk and fragility of many of the components, particularly the television tube and the cabinet."

Synchotron Gap: Worth Closing?

CBO also reviewed suggestions that the government back consortia researching chip lithography methods capable of writing features smaller than 0.3 microns. Most people in the semiconductor industry believe that the prevailing technique, optical lithography, cannot achieve smaller sizes, so researchers are beginning to explore X-ray, electron beam, and ion beam lithography. X-ray lithography, either from massive synchotron rings or point sources, is the current favorite.

Japan has an active synchotron program, and some in the U.S. have warned of what could be called a "synchotron gap," reminiscent of the so-

(continued on page 2)

called missile gap of the late 1960's The government, they suggest, should fill the gap by placing more funds into synchotron programs.

CBO, however, argues that many of the Japanese synchotrons are inappropriate for lithography, and since each instrument can generate 16 separate beamlines (on average), the Japanese have overcapacity. The current U.S. effort, involving the Energy Department's Brookhaven National Laboratory, IBM, DARPA, and the Naval Research Laboratory, may be sufficient.

CBO also points out that synchotron-based X-ray lithography is only one of many competing technologies. It says, "If successful, a synchotron X-ray lithography project may accelerate tendencies toward vertical integration in the industry. The pieces of equipment developed by this effort are likely to be expensive and to be geared toward mass production. They will be of most benefit to well-capitalized producers of integrated circuits, such as memories, with very large markets.... If anything, synchotron-based lithography should strengthen the bifurcation of the industry into very large vertically integrated and usually captive producers and producers who serve special markets or niches."

Unfortunately, the CBO report fails to comprehensively evaluate the environmental and job safety impact of alternate manufacturing technologies. The shift to new production methods and machinery would open up possibilities for reduced the use of toxic substances in chip production, but CBO deigns only one mention of production hazards. It reports that X-rays generated by point sources such as plasma sources or lasers, as opposed to synchotron beams, "pose less of a potential hazard in terms of exposure to radiation."

Joint Manufacturing

Finally, CBO analyzes proposals to ease antitrust rules governing joint manufacturing ventures. It points out that current law permits many types of combined production. It notes that U.S. Memories, the IBM-proposed joint memory chip project, failed "not because of antitrust laws, but because the DRAM market had excess capacity.

In reviewing industrywide production ventures, CBO concludes, "Good reason exists for discouraging such ventures. First, a strong potential for collusion exists.... Second, while international competition might initially cause a joint production venture to curb price increases, later changes in international trade—such as orderly marketing agreements or voluntary restraining agreements—might give the venture substantial power in the domestic market."

CBO also warns, "a production consortium that could expand into related activities might shift from areas where there is a public interest (as in DRAM's) to areas where there is not (as in SRAM's)." It relates a similar shift by the R&D consortium MCC (the Microelectronics and Computer Technology Comporation). Originally formed to counter Japan's Fifth Generation Computer Project, "MCC is now involved in producing software that competes with U.S. start-up companies in engineering software markets currently dominated by U.S.-owned firms."

SEAGATE IN ASIA

Seagate Technology, the leading producer of compact hard disk drives, employs two thirds of its workers in Asia. It is the largest private employer in Singapore, with 12,400 workers, including 1,900 women bused in daily from Malaysia. In Bangkok, Thailand, the firm employs nearly 15,000.

Evelyn Richards of the **Washington Post** writes (June 17, 1990), "At a time when nearly every other high-technology industry seems to be losing ground to Japan, this one has stayed American—but largely in name only. These companies, with California-based Seagate leading the pack, are not the so-called 'stateless' corporations that disperse their operations rather evenly around the world. Rather, they are companies that keep their most highly paid, highly educated employees in the United States and deposit a lopsided proportion of their manufacturing in Southeast Asia,

GLOBAL ELECTRONICS

edited by Lenny Siegel

Issue No. 104

published monthly by the Pacific Studies Center
222B View Street, Mountain View, CA
94041 - USA 415/969-1545

US ISSN 0739-0416

subscription rates (12 issues)
United States: $12.00
Canada and Mexico: US$14.00
Overseas: US$17.00

all back issues are available

moving when necessary from place to place in ruthless pursuit of cheaper labor, generous tax havens, and lower-priced parts and services."Seagate first set up shop in Singapore in 1982, cutting both its costs and domestic workforce drastically. Soon, its competitors followed. Today the island nation supplies 70% of the world market for hard drives for desktop computers. "The shift to Singapore has been so complete that some key parts needed to make the disk drives can no longer be bought in large quantities or at reasonable prices in the United States."

James McCoy, chairman of Maxtor, another U.S.-owned drive-maker, told the **Post**, "You can do business in the disk drive industry in Singapore in a more concentrated and streamlined manner than anywhere else in the world.... Effectively all you need is right there—and it's not an accident."

Some U.S. managers still consider its female Singaporean employees "mini-robots," but the government is pushing companies to upgrade from assembly into better-paid, higher skilled work. Singapore workers now earn about US$2 per hour.

Meanwhile, Seagate is expanding production in Thailand, where the labor supply is greater and wages are lower—starting at about US$.50 per hour. Seagate founder Alan Shugart told the **Post**, "In Thailand there is a lot of close work under microscopes. It is pretty tough to find people in the U.S. to do that kind of work."

Nevertheless, many Seagate employees regard the firm as a "big family." The company trains new workers in family planning, nutrition, and the use of Western-style toilets, and it offers English-language training.

JOBS/HOUSING IMBALANCE

The industrial suburbs of northern Santa Clara County have for the last few decades provided many more employment opportunities than residential space. Silicon Valley suffers from a jobs/housing imbalance, in which much of the workforce—particularly those with low and moderate incomes—is forced to commute from distant bedroom communities. The development of high-tech industry in north San Jose, itself representing a jobs-housing imbalance within San Jose, has done little to reverse the situation.

Wealthy hillside communities such as Los Altos Hills and Saratoga deliberately discourage employment-generating business. With their astronomic housing valuations and consequent strong residential property tax bases, they can afford it. San Jose, however, is stuck servicing many of Valley's lower income workers while it reaps comparatively little from company-paid taxes.

In 1990 the Association of Bay Area Government published new data on the relationship between jobs and housing. Here are the figures for the county's major cities. ("Jobs/Housing Ratios by Jurisdiction, Santa Clara County-1990," **Info**, Santa Clara County Advance Planning Office, Issue #90-3A, May 21, 1990)

City	Jobs/Employed Resident	Jobs/Household
Santa Clara	2.08	3.19
Palo Alto	2.07	3.20
Sunnyvale	1.83	2.73
Mountain View	1.54	2.21
Milpitas	1.49	2.63
Cupertino	1.44	2.41
San Jose	.74	1.16

PAY RANGES

Pay rates in Silicon Valley remain polarized. The North Valley (NOVA) Private Industry Council released survey data recently, showing that computer programmers make almost three times as much as assemblers. NOVA reported Spring, 1989 wages for "entry-level" workers with no experience in an occupation and "starting" wages for experienced workers new to firms. (**Labor Market Bulletin, San Jose Area**, California Employment Development Department, Second Quarter, 1990.)

Occupation	Entry Wage	Starting Wage
Assembler	$ 4.50-7.50	$ 4.75-9.00
Tester	5.00-10.00	5.50-10.00
Data Entry Clerk	5.00-10.00	5.75-11.00
Technician	7.00-12.00	8.50-17.50
Programming Aide	8.75-16.50	10.00-19.00
Programmer	11.50-20.00	13.00-26.00

HARRIS WORKERS FIGHT FOR RECOGNITION IN MALAYSIA

American semiconductor firms in Malaysia continue to oppose the unionization of their workers. Despite a Malaysian government policy accepting in-house unions—while rejecting an industry-wide labor organization—the Florida-based Harris Corp. refuses to recognize the clear preferences of its integrated circuit assembly workers. (See **Global Electronics** Nos. 93 and 94.)

(continued on page 4)

In 1989, following Harris' purchase of General Electric and RCA's chipmaking operations, Harris took over RCA's assembly plant in Kuala Lumpur. The company rejected workers demands for recognition, but in January 10, 1990 the Malaysian Industrial Relations Department ordered it to recognize the Harris Solid State Malaysia (HSSM) Workers Union within 14 days.

On the 13th day, Harris transferred the operation—workers, equipment, management, etc.—to another local subsidiary, Harris Advanced Technology. Workers were forced to sign transfer letters, in apparent violation of Malaysian law. All but 24 union leaders and activists, out of 2,500 workers, were "transferred."

Despite extensive coverage in the Asian media—including the **Asia Wall Street Journal** and the **Hong Kong Standard**—Harris has escaped publicity in the U.S. In June, the AFL-CIO and the International Labor Rights Education and Research Fund (ILRERF) filed petitions with the U.S. International Trade Representative to revoke Malaysia's preferential trade status under the Generalized System of Preferences (GSP). Although U.S. law now provides for such revocation when labor rights are denied, the Trade Representative's office refused even a hearing. In September, ILRERF filed a motion, in the Federal courts, asking that the Trade Representative hear its petition.

Members of Congress are reportedly meeting with Harris to see if the company is willing to respond to its Malaysian workers' demands for representation. If the company continues on its present path, it is likely that they will introduce new legislation extending or strengthening international labor rights protections, to ensure that Harris is covered.

We think U.S. subsidies to high-tech industry should be conditioned on respect for labor rights. For example, Harris, along with 13 other U.S.-owned electronics companies, is a member of Sematech, the semiconductor manufacturing technology consortium. The Defense Advanced Research Projects Agency promotes the "competitiveness" of the U.S. semiconductor industry by giving Sematech at least $100 million each year.

Such funding should be withheld unless all the corporate members of Sematech recognize, in practice as well as on paper, the rights of their workers to organize. If support for competitiveness is to continue, then it must either support production within the U.S. or protect labor standards in the U.S. by reinforcing labor rights abroad.

This strategy might be difficult to sell to Sematech's liberal backers, who still think American-owned chipmakers are patriotic providers of production jobs in the U.S. Some might argue that the labor rights criterion would prevent government support merely because one member of the consortium misbehaves abroad. In fact, however, most of Sematech's members have consistently denied labor rights in Malaysia and other offshore production sites. It would make as much sense to threaten them with punishment for unfair labor practices in Malaysia as to punish Malaysia by making if more difficult for that country to ship other—that is, non-high tech—products to the U.S. under the GSP.

Address Correction Requested

Pacific Studies Center
222B View Street
Mountain View, CA
94041 - USA

BULK RATE
Non-Profit Organization
U.S. POSTAGE
PAID
PERMIT NO. 155
MOUNTAIN VIEW, CA.