Research Report

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Florida's Investment in High Technology Should Produce Significant Benefits

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Government can do nothing more important for its citizens than to provide the opportunity to be self-sufficient and gainfully employed in a productive, growing economy. A high-skill, high- wage job produces both economic and social benefits to the individual worker, the local community, the state and the nation. Florida has chosen to invest for its citizens' economic well being with judicious use of targeted economic development incentives (**Appendix 1**).

Through the efforts of Enterprise Florida (formerly the Florida Department of Commerce), selected industry sectors have been targeted as "high impact" -- contributing significant benefits to Florida's economy and workforce. Among these sectors is the "Silicon Technology" industry. This research report will analyze the economic and fiscal impact that a plant in this industry, locating to Florida, can have on the economy.

Florida Lags in High-Tech Growth

Creating new high tech jobs in the silicon technology (semiconductor) industry are important to Florida's economy. Nationally, the average wage for semiconductor workers was $54,942 in 1996.[1] However, among the top 10 "High-Tech" states, Florida only ranks sixth in employment, and an even lower seventh, in the number of new high-tech jobs created in 1996.

Top 10 High-Tech States by Employment 1995-1996 [2]

1996 Ranking	1995 Ranking	State	1996 Employment	1995 Employment	New Jobs	1996 Ranking	Percent Change
1	1	California	724,181	669,349	54,382	1	8.19%
2	2	Texas	341,193	313,460	27, 733	2	8.85%
3	3	New York	306,303	295,649	10,654	3	3.60%
4	5	Illinois	198,720	189,062	9, 658	6	5.11%

5	4	Massachusetts	197,407	190,036	7,371	8	3.88%
6	**4**	**FLORIDA**	**184,009**	**175,709**	**8,300**	**7**	**4.72%**
7	7	New Jersey	168,323	164,929	3,394	10	2.0 6%
8	8	Pennsylvania	151,183	145,531	5,652	9	3.88%
9	9	Virginia	137,183	126,810	10,373	5	8.18%
10	11	Georgia	124,868	114,454	10,414	4	9.10%

Economic and Fiscal Benefits to Florida's Economy

A new silicon chip manufacturing plant located in Florida would affect the economy in two ways. First, by the construction and annual operations of the facility (economic) and second, by the fiscal (state taxes) impact of these activities. Each adds increased value to Florida's economy, new employment (jobs), increased household earnings and tax revenues.

A typical silicon chip manufacturing plant costs approximately $1.0 billion to construct and equip. When fully operational, it will employ about 1,000 workers with average annual earnings of $35,000. Annual production and operating costs are estimated in excess of $300 million per year. The economic impact to Florida can be estimated through the use multiplier factors developed by the U.S. Department of Commerce, Bureau of Economic Analysis.

Economic Benefit

In the first phase (*construction*) the multiplier model indicates that the construction of a $300.0 million plant ($700.0 million of the $1.0 billion is attributable to equipment, thus not included in this analysis) would add more than **900 full and part-time jobs** to Florida's economy and increase earnings by more than **$193 million** (see Table 1).

The second phase (*operations*) of estimating the impact in Florida, the annual expenditures of the plant are applied to corresponding multiplier factors. As shown in **Table 2**, the annual plant operating expenditures will add an additional **1,982 full and part-time jobs**. and increase earnings of households by more than **$57 million**.

Fiscal Benefit

In a previous study conducted by Real Estate Research Consultants, Orlando, Florida, the fiscal impact of a similar silicon technology plant was analyzed. Drawing on the methodology employed in that study, the following is an estimate of the increase in state sales taxes that would be generated in the current case.

Construction Phase:

☞Estimating that 60% of the construction cost is taxable materials ($180 million); state sales tax (at 6.0%) paid equals **$10.8 million**.

Annual Operations:

☞Estimating that direct plant taxable expenditures (excluding employee salaries and wages) are $265 million per year (in first full-year of operation); state sales tax (at 6.0%) paid equals **$15.9 million per year**.

☞Estimating indirect taxable expenditures (plant employees disposable income purchases) are $12.5 million; state sales tax (at 6.0%) paid equals **$750,000 per year**.

Over a ten-year period, the state will derive more than $197 million in sales tax revenues from the construction and operations of the new plant. This projection excludes local tax revenues and other state tax revenues that will be generated.

Summary of Economic and Fiscal Benefits

Employment (new jobs)	2,906
Earnings	$250 million
State Sales Tax: 10-year revenues	$197.3 million

The location of a new silicon technology plant in Florida would produce extraordinary economic and fiscal benefits as shown in the above table. In addition, the plant would act as a catalyst for new support businesses to expand or locate in the plant vicinity. These would also add to Florida's economic health. Purchases that would ordinarily be made from out-of-state could be filled by Florida suppliers.

Florida has begun to put in place the necessary investments to attract new silicon technology businesses to the state. In addition to economic development incentives (Appendix 1), investment in human capital has begun. As an example, Valencia Community College has developed a Manufacturing Technology program with a specialization in microelectronics manufacturing. The program was developed from an analysis of industry needs in the Central Florida region. A survey of 200 manufacturers in Central Florida recently indicated that there was an immediate need for 80 new positions for graduates with a specialization in microelectronics engineering and the demand for qualified technicians was expected to grow rapidly. Currently, there are approximately 2,000 high tech and manufacturing companies in the Central Florida, employing 48,000 people.

The microelectronics engineering for manufacturing program at Valencia Community College is an Associate of Science degree program that prepares students for entry level

technologist positions in the high technology and manufacturing industry. It provides an opportunity for those currently working in the field (its primary target audience) to upgrade skills and to develop the skills necessary for advancement. Developed through the insight and leadership of Charles Parrish, the program currently has 40 students enrolled and enrollment is expected to double in the next two years.

Methodology

In the mid-1970's, the U.S. Department of Commerce, Bureau of Economic Analysis developed a model for estimating regional I-O multipliers known as RIMS (Regional Industrial Multiplier System). Updated in the mid-1980's (RIMS II) and 1997, the "*...I-O multipliers from RIMS II can be used to estimate the impacts of project and program expenditures by industry on regional output (gross receipts or sales), earnings, (the sum of wages and salaries, proprietors' income, and other labor income, less employer contributions to private pensions and welfare funds), and employment (number of jobs).*" [3]

RIMS II multipliers are used in the following analysis to estimate the economic impact associated with locating a silicon technology plant in Florida.

Construction

The initial phase of estimating the economic impact of a new silicon technology plant is the construction of the facility. Utilizing Final-Demand Output Multipliers for Florida from RIMS II[4], the following table shows the effect on earnings and employment of building a $300 million facility.

Table 1

Industry	Earnings Multiplier	Earnings (dollars in millions)	Employment multiplier [5]	Employment (jobs)
New Construction	.6460	$193.8	30.8	924

Source: RIMS II, 1997

Annual Operations

The second phase of estimating the economic impact of a new silicon technology plant in Florida is the annual operations, from the plant itself as the change, and through the multiplier effect this has on the state's economy. While total operational expenditures are estimated at $300 million annually, the multiplier effect is only related to those purchases/expenditures in Florida. The following table reflects the Florida estimated expenditures and the resulting economic impact of the new plant operations:

Table 2

	Final-demand multiplier			Impact	
Industry	Regional purchases in producers' prices ($000's)	Earnings (dollars)	Jobs	Earnings ($000's) (col 1 x col 2)	Jobs (col 1 x col 3)
.	(1)	(2)	(3)	(4)	(5)
Earnings paid to households	$35,000	.3777	18.7	$13,220	654
Electric services (utilities)	12,000	.2867	9.7	3,440	116
Gas prod and dist (utilities)	2,000	.2113	7.9	423	16
Water svcs (utilities)	5,000	.6002	26.1	3,001	130
Sand and gravel (Silica)	0	.	.	.	.
Computers	1,000	.4043	12.8	404	12
Industrial chemicals (gases)	5,000	.3278	10.8	1,639	54
Subtotal	**$60,000**	.	.	**$22,127**	**982**
Initial change	.	.	.	$35,000	1000
Total	.	.	.	**$57,127**	**1982**

Source: RIMS II, 1997

The $60.0 million in annual operating expenditures also increases employment by 982 full and part-time jobs, to a total of 1982 and earnings by $22.1 million to a total of $57.1 million.

The multiplier impact will increase in subsequent years as additional suppliers of plant materials and services "cluster" in the area. In the above example, only a portion of the operating expenditures (other than earnings paid to households and utilities) are attributable to Florida ($240 million purchased "out-of-state"). This is especially significant with "silica," a major component in the wafer production process, which is not

currently produced in Florida. As Florida purchases increase, output, earnings and jobs will also increase.

Local Impacts

The location of a $1.0 billion silicon technology manufacturing plant in Florida will have an impact at the local level. While the focus of this report was at the state level, it is important to recognize the effect that such a plant will have on local revenues (taxes) and public services.

The primary local revenue source is the ad valorem tax. The plant real estate and tangible personal property (equipment) would be subject to ad valorem taxation. Based on a real estate value of $300 million and equipment of $700 million (each adjusted for tax assessment principals, such as cost-of-sale, depreciation, replacement, etc.), Florida TaxWatch estimates that more than $120 million of local ad valorem taxes6 would be generated over a 10-year period. In addition, direct plant employment and the indirect employment resulting from the multiplier effect would generate additional ad valorem taxes when these workers purchase or rent a house or apartment.

The demand for local public services would increase with the plant operations and new employment. Increased enrollment in public schools; new roads, increased law enforcement and fire protection and other similar public services would be anticipated. Although not determined, the combination of state revenues ($197.3 million) and local revenues ($120 million) would be approximately $10,000 per new worker annually; more than sufficient to offset these costs.7

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Appendix 1

Florida Economic Development Incentive Programs

High Impact Business Performance Grant -- Created in 1997 by CS/CS/SB 1754. Eligibility: Office of Tourism, Trade, and Economic Development (OTTED) must designate that business' industrial sector as a high impact sector. The law identifies Silicon Technology as such a sector. Section 288.108(3)(b), Fl Statutes, provides guidelines on amount of grant. For example, a cumulative investment of $100 million, creating 100 jobs, may be eligible for a $1 million to $2 million grant; $800 million

investment creating 800 jobs eligible for $10 million to $12 million. Businesses engaged in Research and Development investing $75 million and creating 75 jobs eligible for $2 million to $3 million; $150 million investment creating 150 jobs eligible for $3.5 million to $4.5 million. Award: 50% awarded when OTTED and Enterprise*Florida* certify business and that operations have started; balance, when full employment and capital investment goals are met.

Sales and Use Tax Refund: Silicon Technology -- Also created by above bill, this tax expenditure is paid to eligible silicon tech business on transactions involving manufacturing or research equipment. Due to the heavy capital investment required annually for business in this sector to remain competitive, taxing such goods adds significant tax liability to these businesses that are present in very few other states. Eligibility: Certification by Office of Tourism, Trade, and Economic Development and Enterprise*Florida*. Business can receive entire refund, or direct one-half to a university or community college. If the school agrees to the contribution, it must match the funds and come to agreement with the business on providing research or educational services that directly benefit the donor business.[8] Agreement is negotiated by Enterprise*Florida* and monitored by OTTED.

Quick Response Training Program -- "Customer-driven training program designed as an inducement to secure new value-added businesses." Administered by EnterpriseFlorida Jobs and Education Partnership and Department of Education. Eligibility: new or expanding/existing business producing exportable goods or services, create new jobs and employ Florida workers who require custom skill training. Preference given to businesses who fit following criteria: need training for high quality jobs (paying at least 115% of state or local private sector wage); locate business in distressed area or Enterprise Zone; business is important to community economic base; and can provide in-kind or cash match.

Qualified Target Industry Tax Refund Program -- Provides tax refunds to applicants of up to $5000 per job created or $7500 per job created in Enterprise zones. Refund capped at $5 million total refund, with no more than 25% of that in any single year. Business must apply before making a formal decision to locate to Florida.

Economic Development Transportation Fund -- Also known as the "Road Fund", grant to local governments to eliminate transportation problem adversely impacting a specific company's location or expansion decision. Award can be up to $2 million depending on the number of jobs created or retained.

Florida Enterprise Zone Program -- The state provides a number of tax breaks and incentives to business choosing to locate in these zones, hire workers from these zones, or rehabilitate property in these zones. Tax credits are available to businesses paying Florida Corporate Income or Sales and Use Taxes.

Manufacturer Exemption from Sales Tax -- Exemption for specified industries to the general sales tax on electricity used in manufacturing, phased-in over five years (fully implemented on July 1, 2001).

Endnotes

1. As reported by the American Electronics Association from U.S. Bureau of Labor Statistics, Covered Employment and Wages, ES-202 Program, 1997.
2. ibid
3. rims-1.htm at www.bea.doc.gov, September 1997.
4. Florida TaxWatch, in consultation with Enterprise Florida.
5. Total change in number of jobs that occurs in the economy for each additional 1 million dollars of output delivered to final demand.
6. Assumes a combined 20 mill average levy for all entities; county, municipal, school district, etc.
7. As reported in "How Florida Compares" published annually by Florida TaxWatch, the per capita state and local taxes paid by Floridian's in 1996 was $2,196.
8. Note: As an example, in 1997, the University of Central Florida received $1.5 million (as did the University of South Florida) to fund the matching grant program. Cirent Semiconductor matched the UCF grant with $2.0 million in materials and research equipment. Because UCF had four other matching projects for the $1.5 million in addition to Cirent, Cirent accepted $1.0 million as the match for its $2.0 million materials and equipment. This allowed UCF to use the remaining $500,000 for the other four companies. In addition, because UCF needed $350,000 to house the Cirent equipment, Cirent further reduced its receipt to $650,000.

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