

***Ohio Third Frontier
Analysis of Performance***

December 8, 2009



Ohio Business Roundtable, Inc. • 41 South High Street • Columbus, OH 43215 • 614-469-1044
 John F. Barrett, Co-Chairman • Michael G. Morris, Co-Chairman • Richard A. Stoff, President

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***To Ohio's business, higher education and government leaders
 and all those committed to our state's continued economic prosperity ...***

We are pleased to share with you this independent performance review of the Ohio Third Frontier. It is a quantitative analysis that stands up to the level of rigor and due diligence we in the business sector would subject to any of our own projects.

Since the inception of the program in 2003, the Business Roundtable has been a huge supporter of the Ohio Third Frontier. State policymakers have shown great wisdom in how this bipartisan program has been architected and overseen these past six years. Business, technology and higher education stakeholders are to be congratulated for their collaborative and innovative spirit that has helped grow this program. The Third Frontier has emerged as the centerpiece of Ohio's economic development platform and the envy of other elected leaders across America. The reason is simple. The Ohio Third Frontier delivers results.

We want to thank a few key people for their leadership and time in assembling this fact base and analysis, starting with Rick Fearon, Vice Chairman and Chief Financial and Planning Officer of Eaton Corporation, and his staff at the company, especially Tim Earl. Rick partnered with Mark Collar, Chairman of the Third Frontier Advisory Board and Venture Partner, Triathalon Medical Ventures and Dorothy Baunach, Special Advisor to the Business Roundtable and president emeritus of NorTech. We also acknowledge the expert work of Deb Cummings, Assistant Director of the Ohio Department of Development and Ziona Austrian at Cleveland State University.

We at the BRT embrace state initiatives that foster innovation, leverage follow-on dollars, return cash flow, create companies and grow high wage jobs. The Ohio Third Frontier does all of that and more. It has proven itself and must be renewed in as robust and timely fashion as possible. We hope the attached punctuates the business case.

Sincerely,

John F. Barrett
 Co-Chairman

Michael G. Morris
 Co-Chairman

Richard A. Stoff
 President

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 American Electric Power – Michael G. Morris *
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 Vorys, Sater, Seymour and Pease – Russell Gertmenian
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* Member of the Executive Committee

The Ohio Business Roundtable is a partnership of the chief executives of the state's major businesses who represent all sectors of the economy and are committed to working with public leaders to build a better Ohio.

Background:

- The Ohio Third Frontier Commission and Advisory Board engaged SRI International, in partnership with Georgia Tech, to complete an economic impact study of the Ohio Third Frontier. The positive findings from this analysis were released in September 2009. As a result of the data presented in the report, members of both the Commission and Advisory Board felt that there were opportunities to further explore quantitatively the impact of the Ohio Third Frontier on the State's economy.

Purpose of Analysis:

- To conduct a quantitative analysis of the performance of the Ohio Third Frontier (OTF) as it relates to economic measures such as leverage, product sales, tax revenues, return on investment, companies created, employment gains, and other impacts.

Partners in Conducting the Analysis:

- Rick Fearon, *OTF Commissioner*, Vice Chairman and Chief Financial and Planning Officer, Eaton Corporation
- Mark Collar, *OTF Advisory Board Chair*, Venture Partner, Triathlon Medical Ventures
- Dorothy Baunach, Special Advisor, Ohio Business Roundtable and President Emeritus, NorTech

In addition, major contributions to the data and analysis were provided by:

- Tim Earl, Manager-Capital Markets, Eaton Corporation
- Deborah Cummings, Assistant Director, Technology Div., Ohio Department of Development
- Ziona Austrian, Director, Center for Economic Development, Cleveland State University

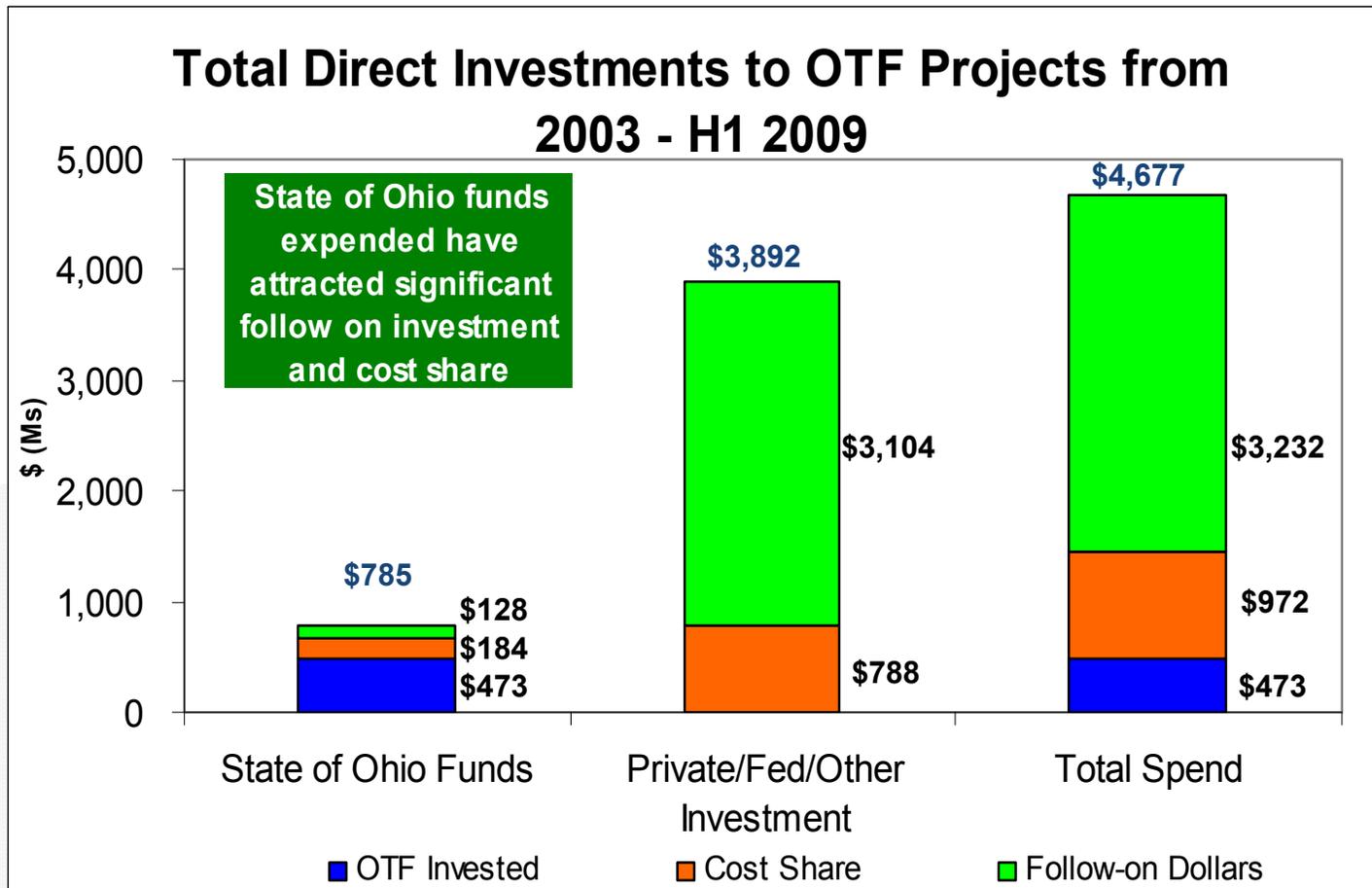
- A. Executive Summary
- B. Funds Invested to Date
- C. Product Sales
- D. Results
 - 1. Tax Revenues and Investment Return
 - 2. Economic Impact
 - 3. Company Creation
 - 4. Employment Performance
 - 5. Venture Capital
 - 6. Technology Transfer
- E. Lessons Learned

A. Executive Summary

- Ohio Third Frontier has attracted \$3.2B in follow-on dollars on top of the \$473M it has expended through June 30, 2009 on technology-based programs
- Product sales from OTF funded projects have grown to \$440M per annum and are estimated to total at least \$900M by 2013
- The return on investment has averaged 22% per annum over the life of the OTF
- 50% of the OTF investment made to date has been repaid through tax receipts with the entire OTF investment forecast to be repaid by 2014
- Employment in high tech in Ohio has grown significantly over the period 2004 through 2008, and in particular, it has grown faster than almost all other Midwest states
- Employment growth in the five target high-tech clusters has been much faster than for the US over that same period
- Venture capital investment growth in Ohio has outpaced the U.S., growing 20.4% versus 8.6% per year since 2003
- Licensing income earned by Ohio's leading research institutions has more than doubled from 2002 to 2007, rising from \$16M to \$40M

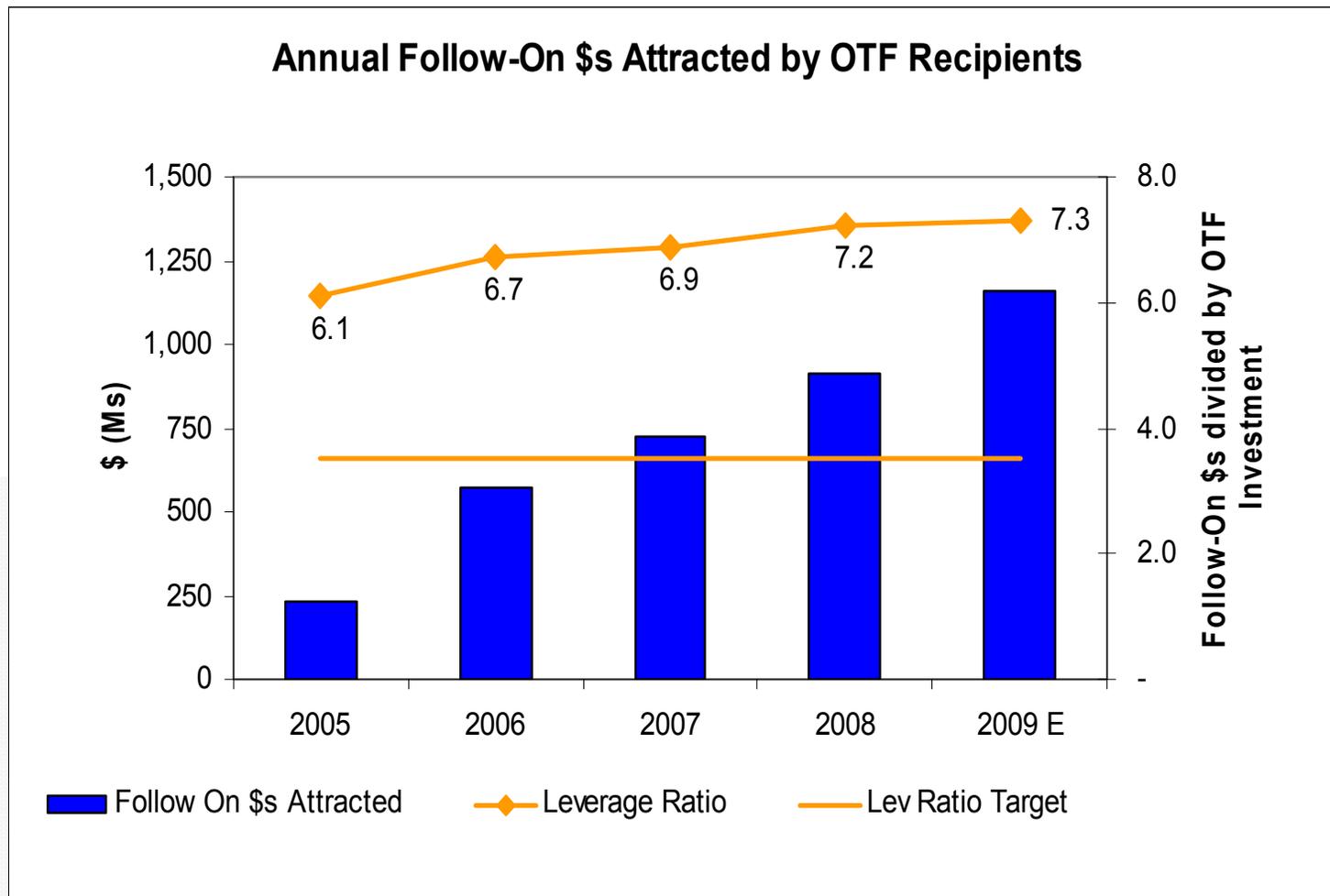
B. Funds Invested to Date

Summary of dollars spent from state funds and other sources



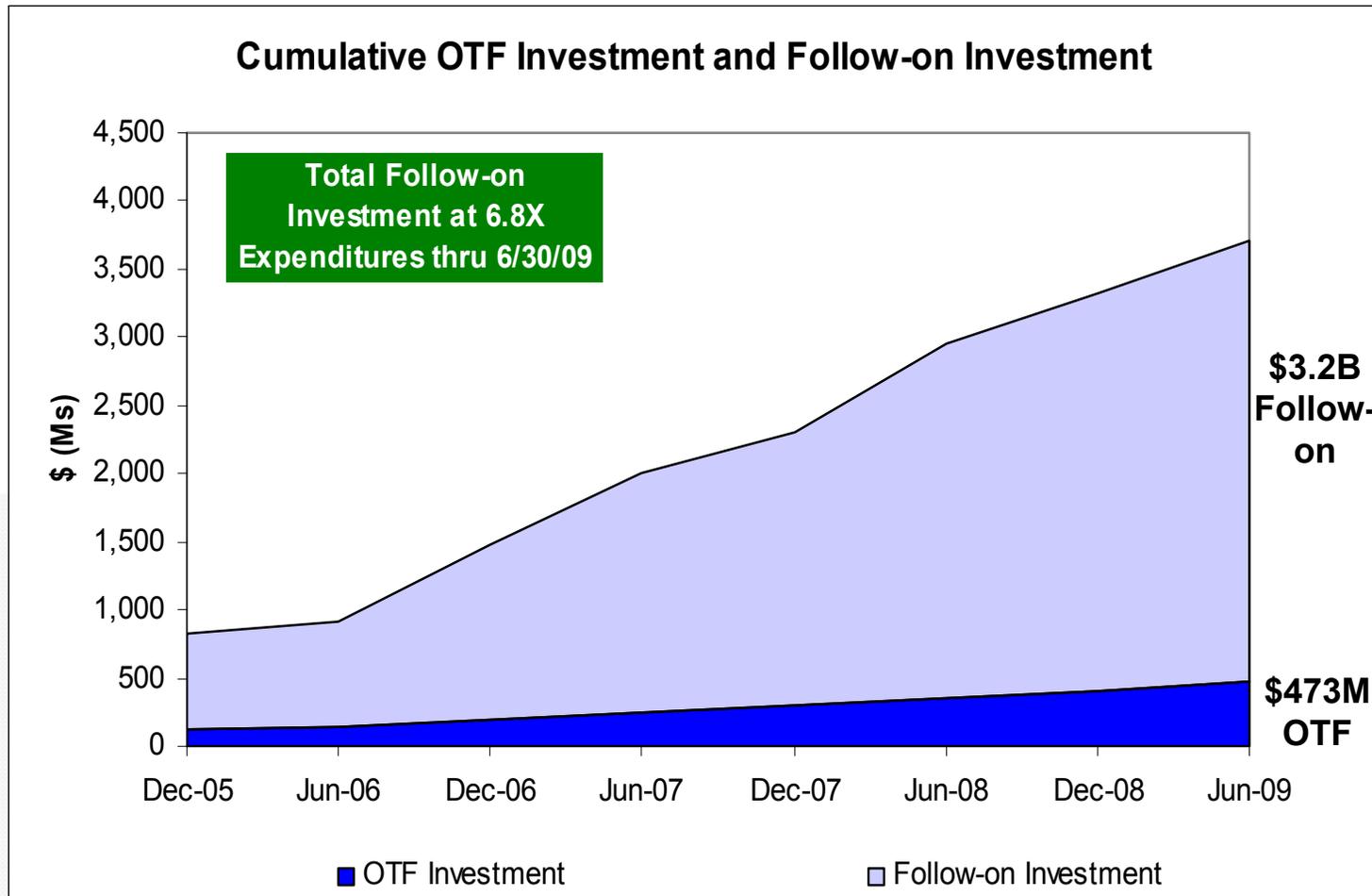
Note: above data from ODOD grant reports through 6/30/09.

OTF investments have attracted 7 times as much follow-on investment



Note: Follow-on Investment (Leverage) excludes Product Sales totals. 2009 E estimated using historic CAGR.

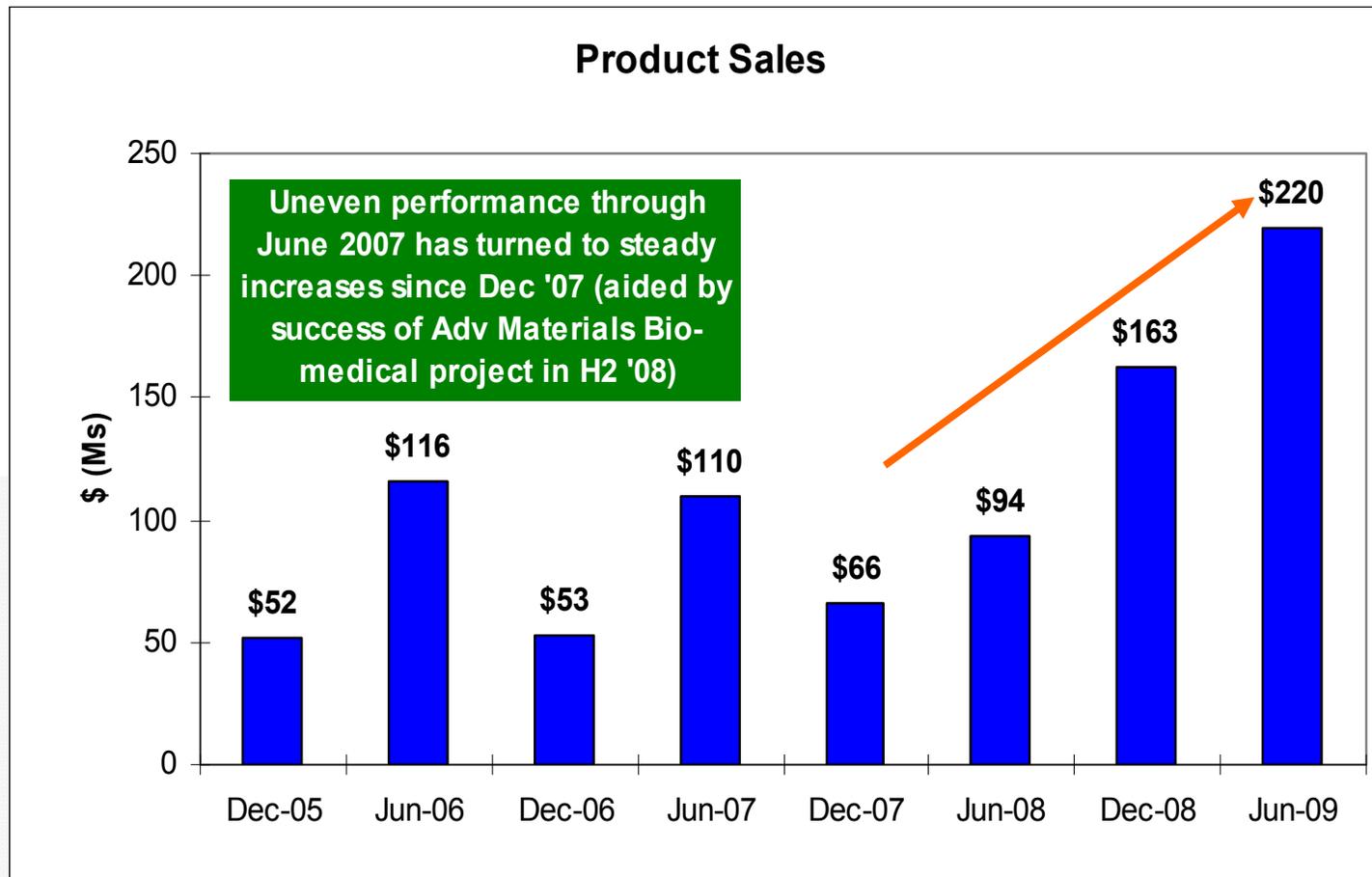
Follow-on investment dollars have far exceeded actual OTF investments



Note: Follow-on Investment excludes product sales totals.

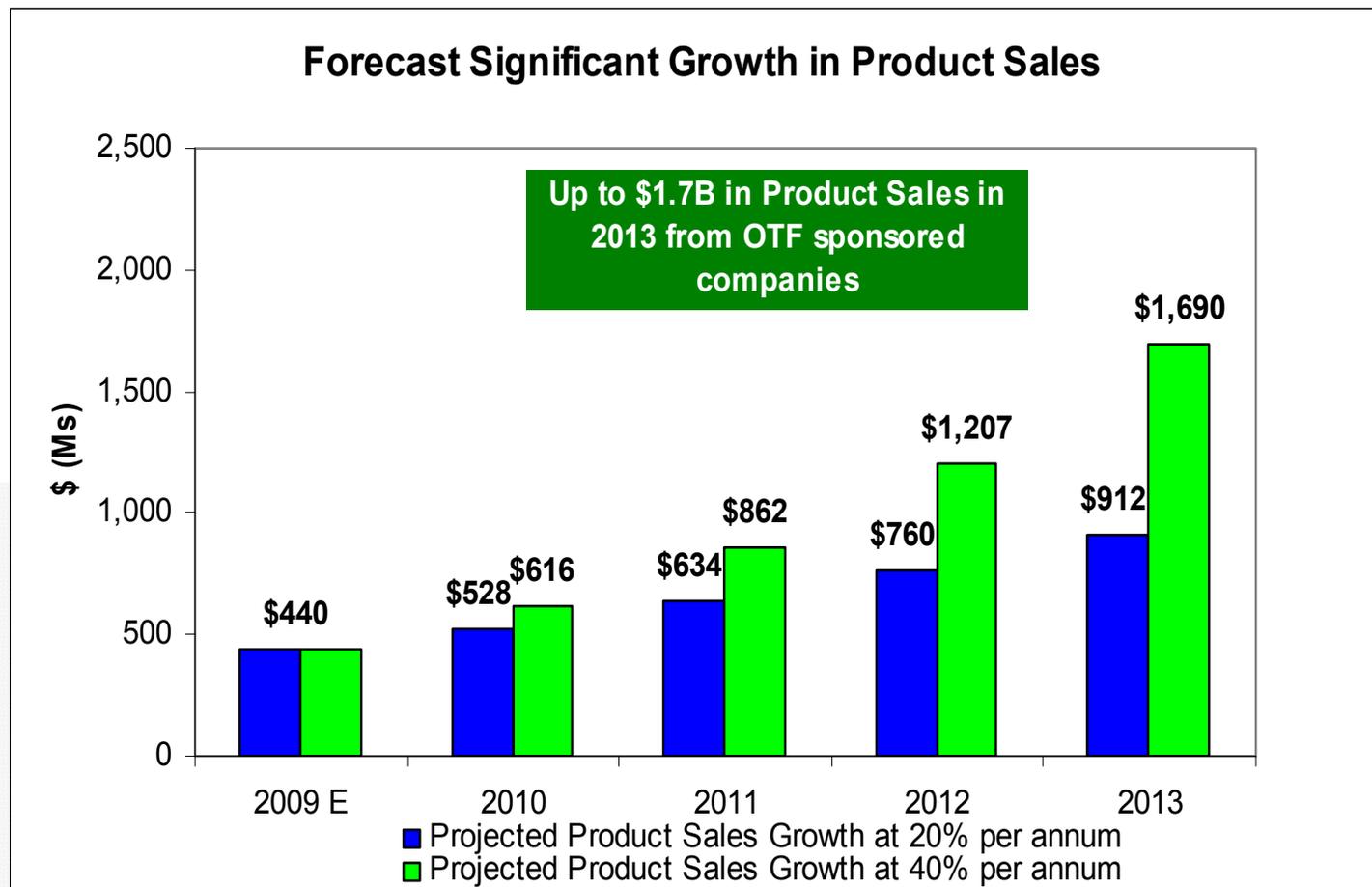
C. Product Sales

Product Sales have grown steadily as OTF has expanded and products have matured



Note: Product Sales are reported by grant recipients as per grant agreement.

Sales are expected to improve further as mix shifts to nearer term commercialization funding

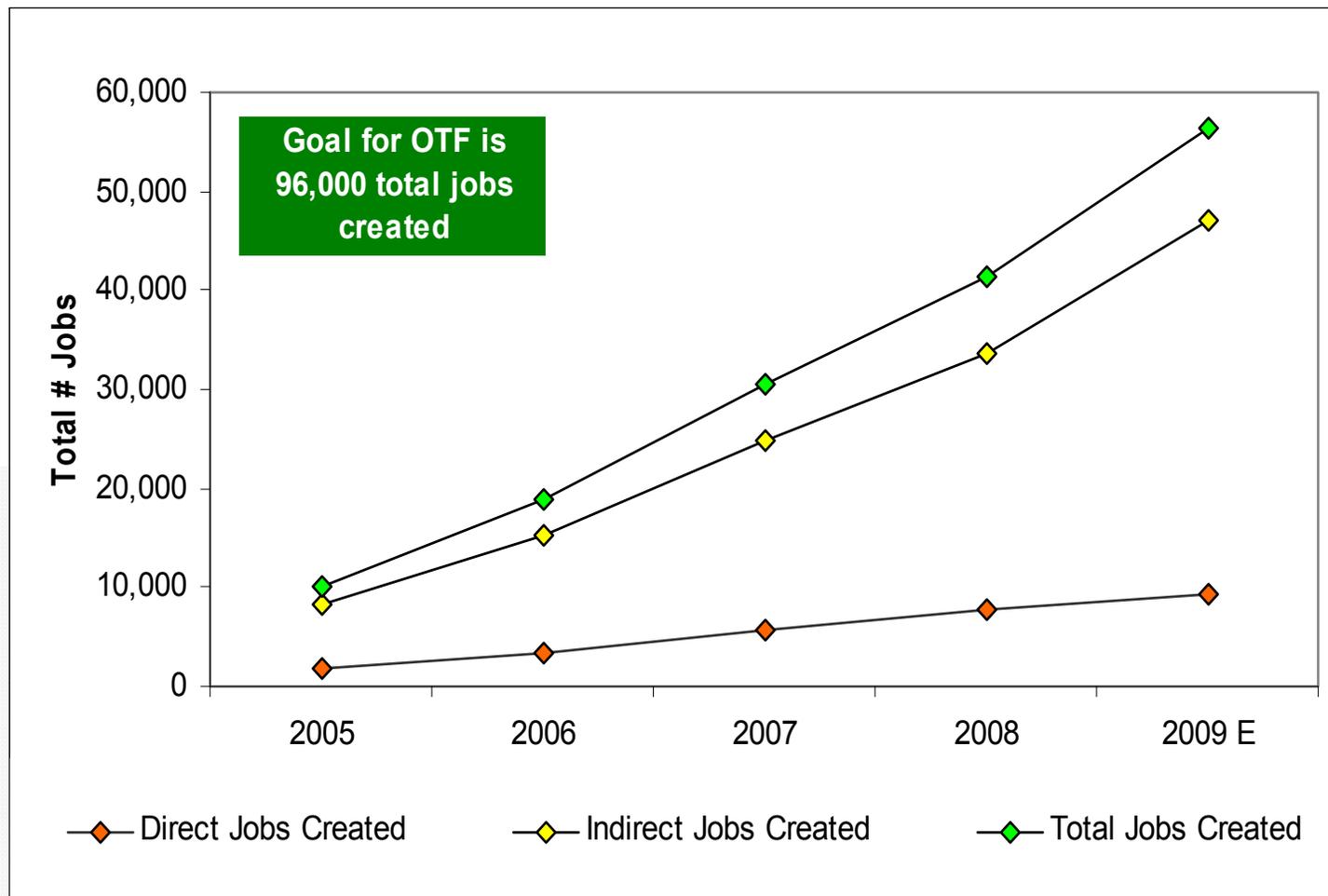


Note: the annual growth rate in product sales has averaged 70% from December 2007 through June 2009. To be conservative, future growth rates have been factored down to a range of 20-40%.

D. Results

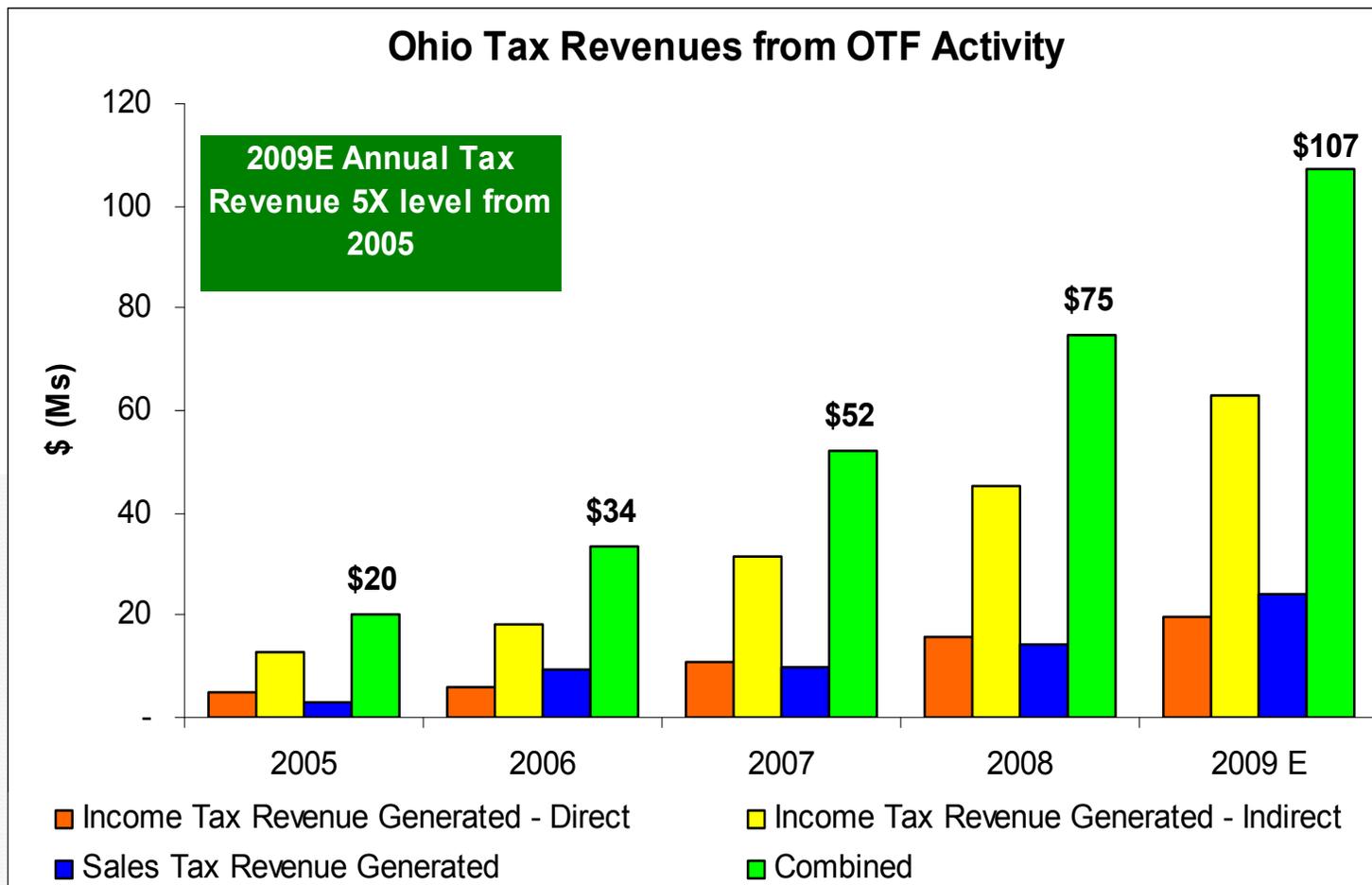
1. Tax Revenues

The OTF has generated significant new employment



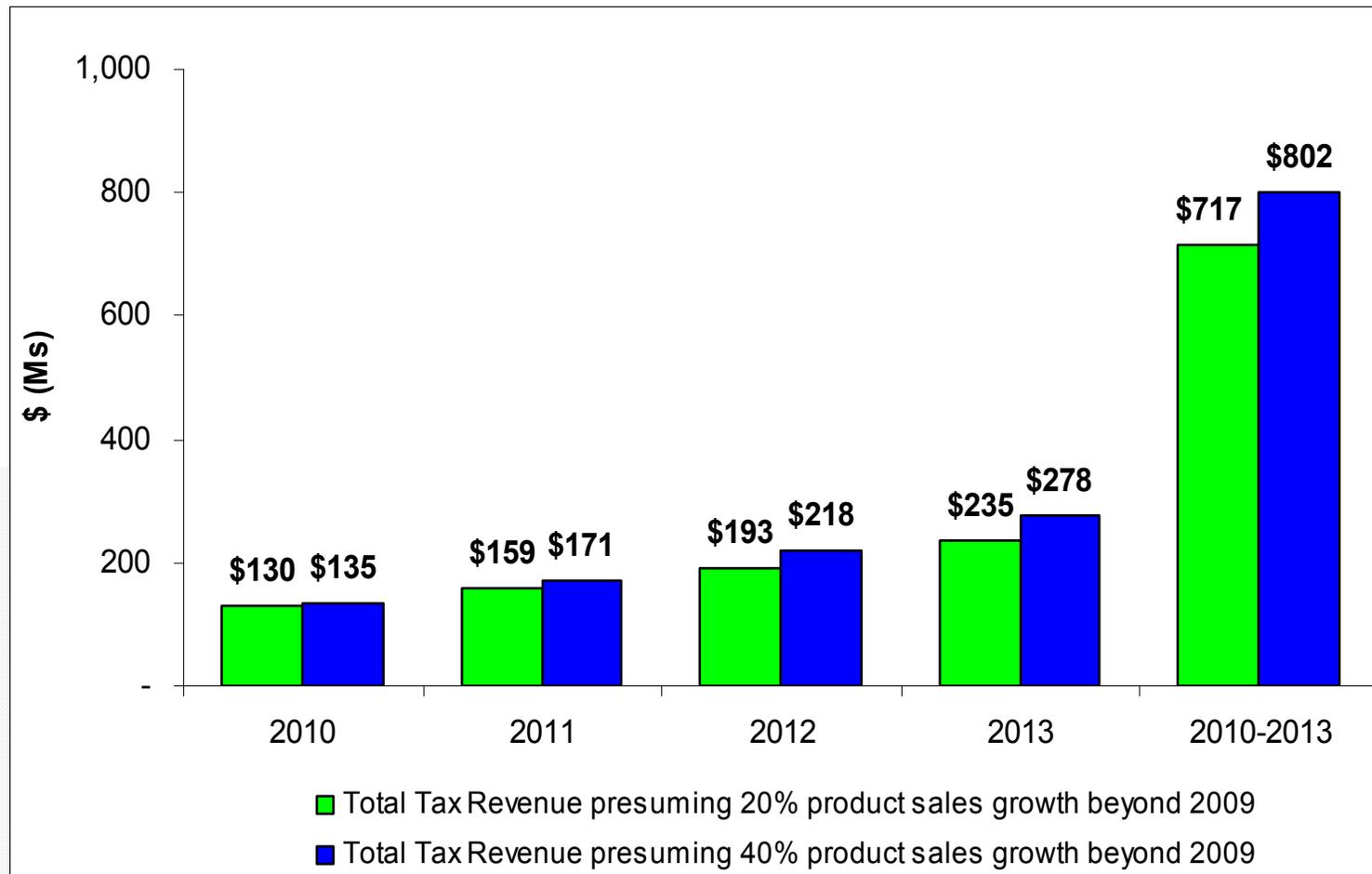
Note: Job creation data collected by ODOD; indirect jobs calculated by SRI and Georgia Tech using IMPLAN input-output model..

Tax revenue has grown driven by employment and growing product sales



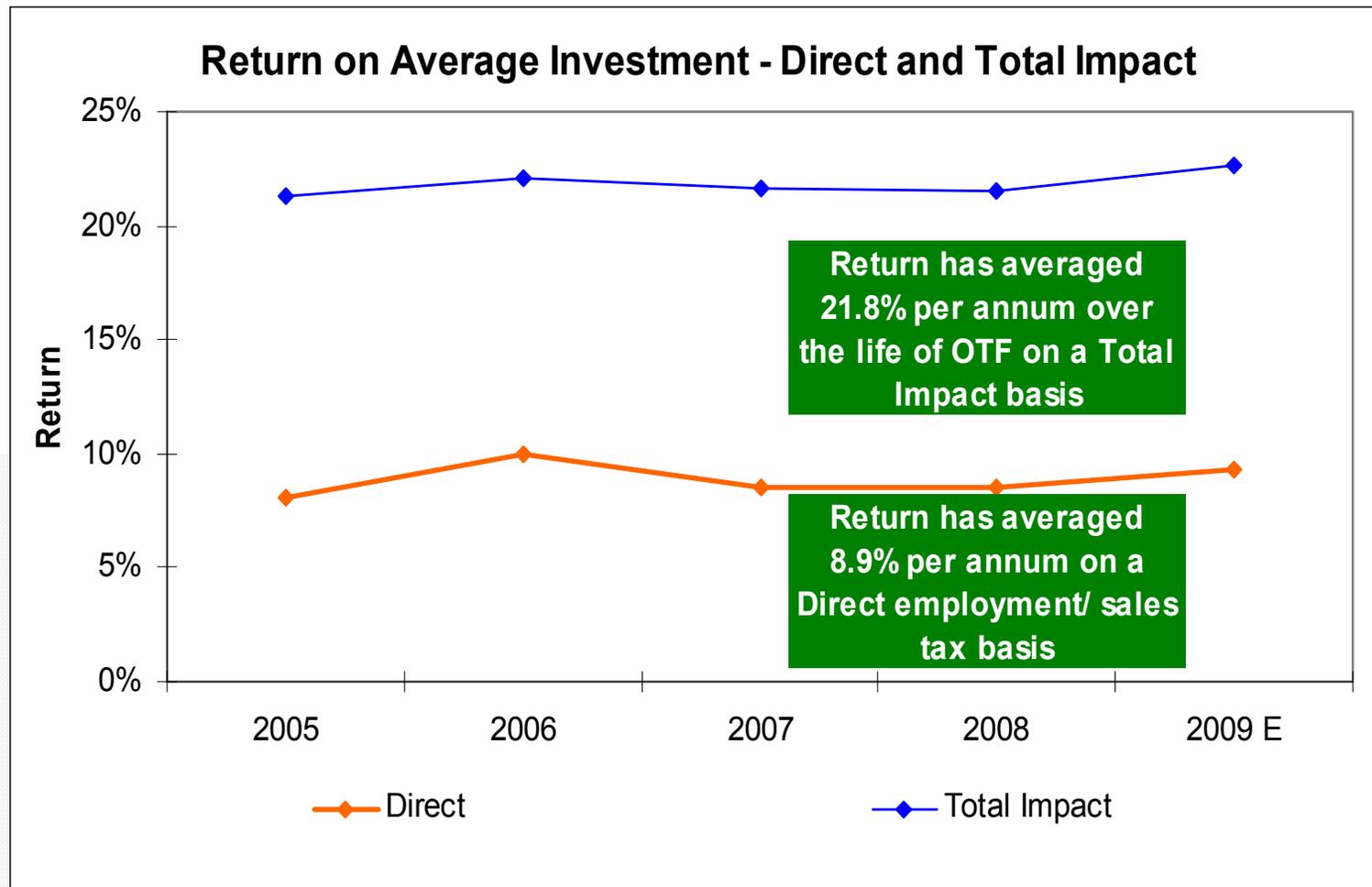
Note: income taxes calculated based upon an estimated average income for direct and indirect employment times applicable income tax rate; sales tax based upon applicable sales tax rate.

Continuation of OTF performance expected to boost Ohio tax revenues further



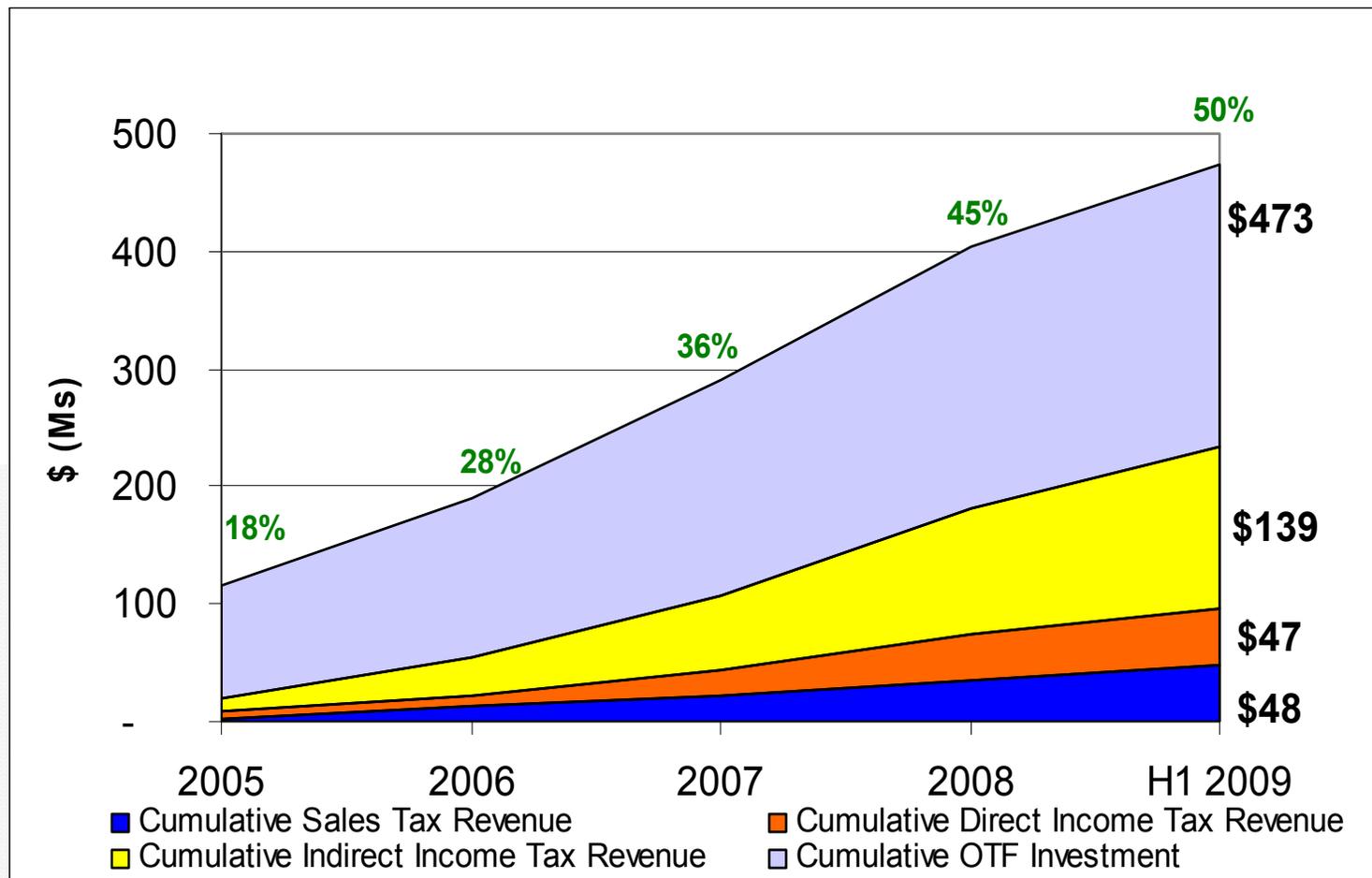
Note: Growth projections presume 2009 YOY employment growth continuing at 20% per annum plus indicated product sales growth. The annual growth rate in product sales has averaged 70% from December 2007 through June 2009. To be conservative, future growth rates have been factored down to a range of 20-40%.

Return on average investment has been consistently strong



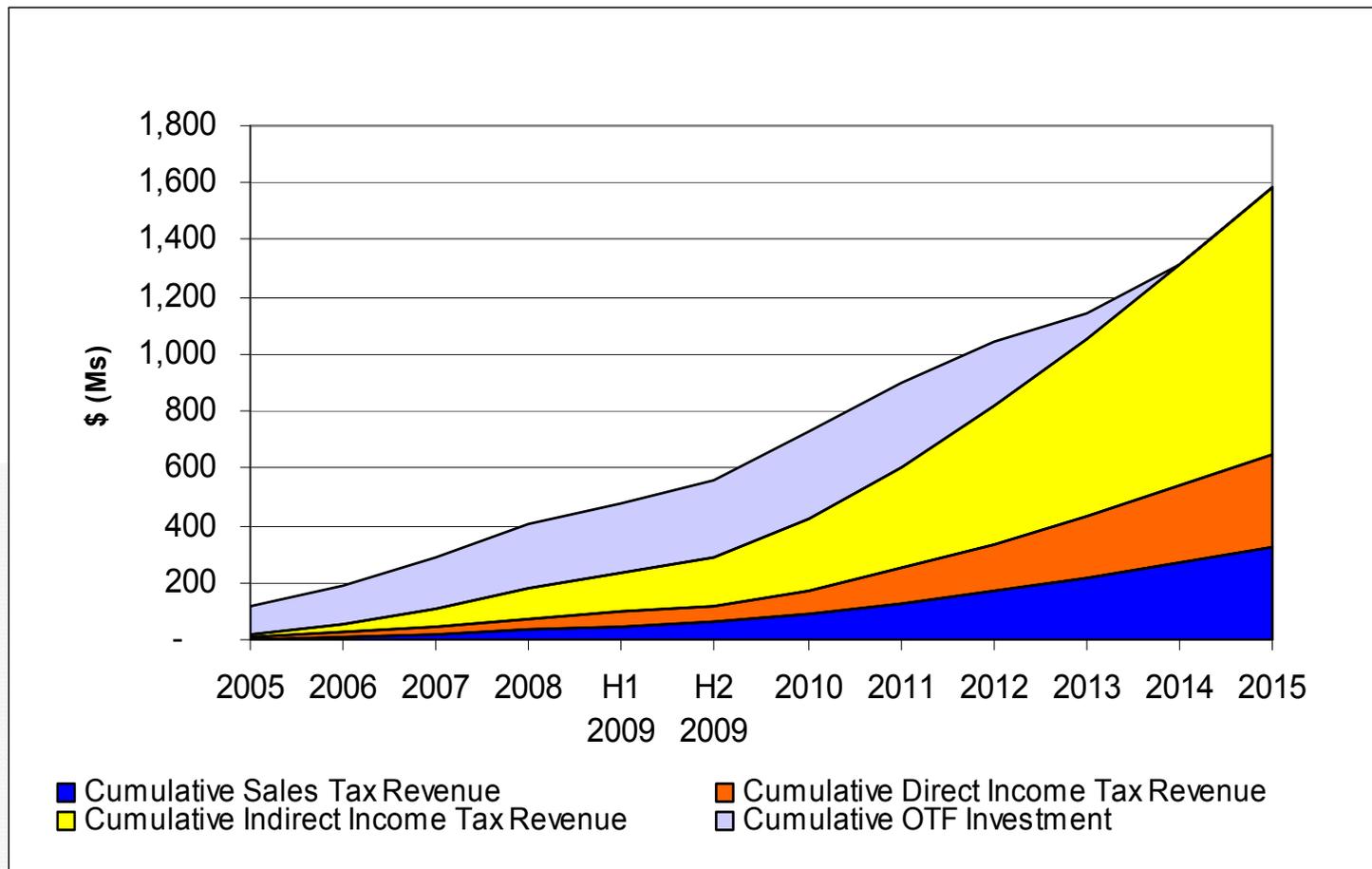
Note: Return on Average Investment calculated as Income plus Sales Tax Revenue divided by the average OTF Investment outstanding in each year.

To date, about half of the OTF investment has been repaid through tax receipts



Note: Return of Investment % calculated as cumulative Income plus Sales Tax Revenue divided by the cumulative OTF Investment at each period end.

Cumulative tax revenue is forecast to exceed cumulative OTF investment by 2014



Note: Forecast assumes historic average return of 21.8% on planned expenditures over life of OTF. Compares forecast of dollars expended to awarded projects against forecast tax revenues to the state from OTF programs. Excludes issuance and interest cost.

On a Net Present Value basis, OTF appears to have created significant value

	2010-2012	2013+
Rate of Return (IRR) Assumption	21.8%	21.8%

Net Cumul											
Spend: Future Cash Flows (Tax Revenue less OTF Investment):											
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
\$	(290)	141 (173)	178 (168)	212 (140)	238 (106)	258 (79)	270 (31)	274	274	274	274
Annual Cash Flow	(290)	(32)	11	72	132	180	239	274	274	274	274
NPV	\$860	(290)	(32)	72	132	180	239	274	274	274	274
Discount Rate	5.00%										

****If the rate of return is higher by 1 percentage point from 2013 onwards, the NPV grows to \$1,097 million***

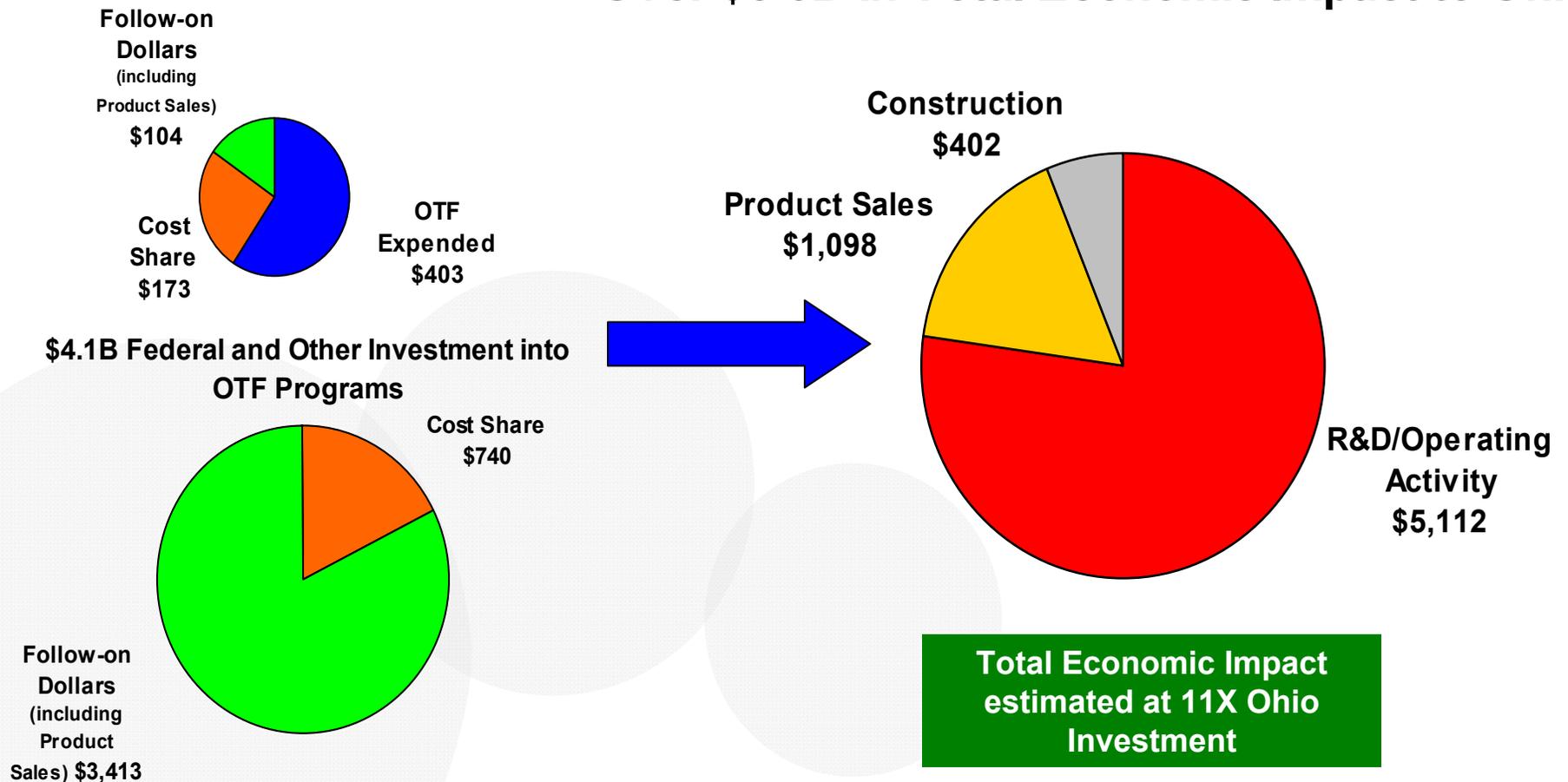
Note: Discount rate assumed at 5%. Net cumulative spend estimated for 2009 by bringing prior year OTF investment and tax revenues to 2009 dollars using CPI (Midwest index). Includes forecast spend for full award of OTF program.

2. Economic Impact

SRI calculates total economic impact to the state exceeds actual Ohio investment by more than 11 times

\$681M State of Ohio Investment into OTF

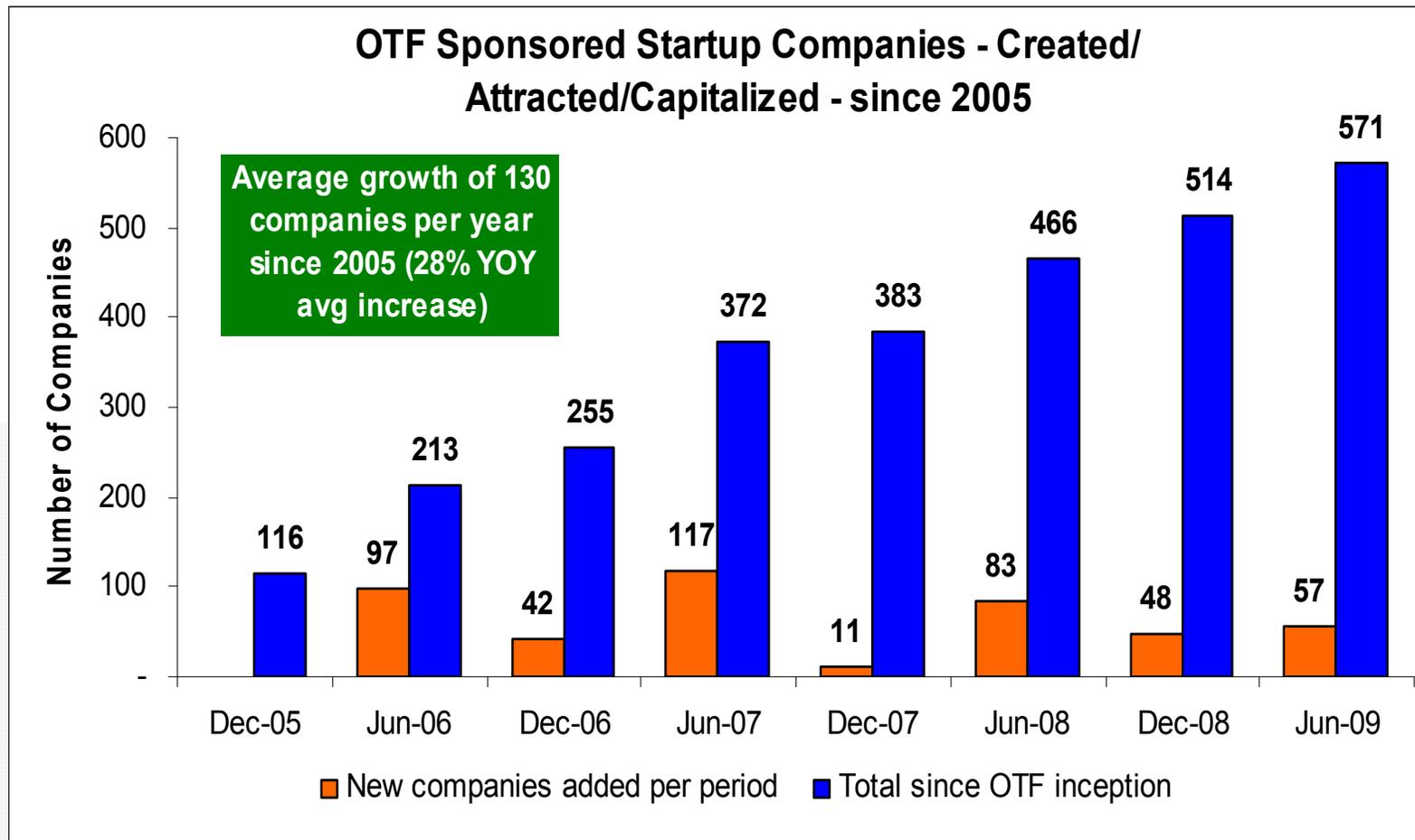
Over \$6.6B in Total Economic Impact to Ohio



Note: as of 12/31/08 (2009 SRI "Making an Impact" report). Cost share represents the amount awarded companies contractually agree to spend upon the grant and is conservatively excluded from Follow-on Dollars which is non-contractual investment.

3. Company Creation

OTF Sponsored Companies have grown 5-fold through June 2009



Note: sustainability statistics to be gathered per new data collection procedures.

4. Employment Performance

High-tech employment in Ohio has risen significantly since 2004, although the rate of growth has lagged the broader US

Job Growth in High-Tech Sectors				
2004 to 2008	Ohio	U.S.	States with Significant Tech Dev Programs	Other States
% Change	6.4%	9.1%	11.2%	7.6%
Number of Jobs Added	22,607	15,646 per state	36,891 per state	9,475 per state

Note: Employment data from U.S. Department of Labor's Bureau of Labor Statistics (BLS) and Ohio Department of Jobs and Family Services. Change based upon Federal definition of High Tech utilizing NAICS employment codes (Hecker) plus Ohio high-tech job codes, less non-OTF focused codes. Tech Dev states defined as maintaining aggressive tech based economic development policies (CO,FL,GA,MD,MA,NY,NC,PA,TX,VA,WA).

Ohio high tech job growth has offset the overall negative trend in the state, whereas other states' high-tech performance benefitted from overall growth in employment

Job Growth				
2004 to 2008	Ohio	U.S.	States with Significant Tech Dev Programs	Other States
% Change in High-Tech Jobs	6.4%	9.1%	11.2%	7.6%
% Change in Non High-Tech Jobs	-1.7%	3.9%	5.6%	3.1%
Net Outperformance of High-Tech Growth	+8.1%	+5.2%	+5.6%	+4.5%
Overall Employment Performance	-1.1%	4.3%	6.1%	3.5%

Note: High Tech employment based upon Federal definition of High Tech utilizing NAICS employment codes (Hecker) plus Ohio high-tech job codes, less non-OTF focused codes. Tech Dev states defined as maintaining aggressive tech based economic development policies (CO,FL,GA,MD,MA,NY,NC,PA,TX,VA,WA).

High tech employment in Ohio has grown faster than almost all other Midwest states

Benchmark State	2004 High Tech Employment	2008 High Tech Employment	Change in High-Tech Employment			
			Number of Jobs Added	Rank	Percentage Change	Rank
Ohio	354,024	376,631	22,607	8th	6.4%	35th
Illinois	380,600	395,111	14,511	19 th	3.8%	43 rd
Indiana	195,173	206,713	11,540	25 th	5.9%	37 th
Kentucky	84,521	89,816	5,295	32 nd	6.3%	36 th
Michigan	332,497	319,400	(13,097)	51 st	(3.9%)	49 th
Pennsylvania	367,276	388,244	20,698	10 th	5.7%	38 th
Wisconsin	173,467	187,362	13,895	20 th	8.0%	31 st
Tech-Focused States						
Colorado	183,094	198,379	15,285	17 th	8.3%	29 th
Florida	385,039	419,471	34,432	5 th	8.9%	24 th
Georgia	233,095	250,216	17,121	14 th	7.3%	33 rd
Maryland	193,282	210,406	17,124	13 th	8.9%	26 th
Massachusetts	308,472	335,854	27,382	6 th	8.9%	25 th
New York	472,593	487,494	14,901	18 th	3.2%	44 th
North Carolina	253,679	280,128	26,449	7 th	10.4%	21 st
Pennsylvania	367,276	388,244	20,698	10 th	5.7%	38 th
Texas	673,089	798,493	125,404	1 st	18.6%	10 th
Virginia	304,980	345,858	40,878	4 th	13.4%	15 th
Washington	239,573	305,427	65,854	3 rd	27.5%	3 rd

Note: Employment change based upon Federal definition of High Tech utilizing NAICS employment codes (Hecker) plus Ohio high-tech job codes, less non-OTF focused codes. Tech Dev states defined as maintaining aggressive tech based economic development policies (CO,FL,GA,MD,MA,NY,NC,PA,TX,VA,WA).21

OTF has focused on developing five key technology clusters...

Cluster	Description	Example OTF Recipient Companies	Investment
Advanced Energy	The advanced energy industry in Ohio includes such areas as fuel cells, photovoltaics, wind, biomass and energy storage.	Parker Hannifin, Rolls-Royce, Velocys, Global Cooling, NexTech, Xunlight, Catacel, GrafTech, SCI, American Trim, UltraCell	\$70 M
Advanced Materials	The advanced materials industry in Ohio includes such areas as advanced polymers, composites, nano-materials, liquid crystals, and bio-based materials.	Swagelock, The Andersons, Applied Sciences, Nanotek, Zyvex, WebCore, AlphaMicron, Kent Displays	\$96 M
Biomedical	The biomedical industry in Ohio includes such areas as cardiovascular, biomedical imaging, regenerative medicine, and orthopedics.	Arteriocyte, NDI Medical, ViewRay, Hyper Tech, ChanTest, Diagnostic Hybrids, Gene Express	\$208 M
Instruments, Controls, and Electronics	The ICE industry in Ohio includes such areas as sensors for all manner of manufacturing, unmanned aerial vehicles, infrared imaging detection, and RFID technologies.	Faraday, L-3 Communications, Srico, YSI, Western Robotics, LSP Technologies, Western Datacom	\$27 M
Power and Propulsion	The power and propulsion industry in Ohio includes such areas as aircraft turbines, industrial turbines, and power generation.	GE Aircraft, Rolls-Royce, Teledyne	\$22 M

Note: Definitions and investment dollars provided by ODOD.

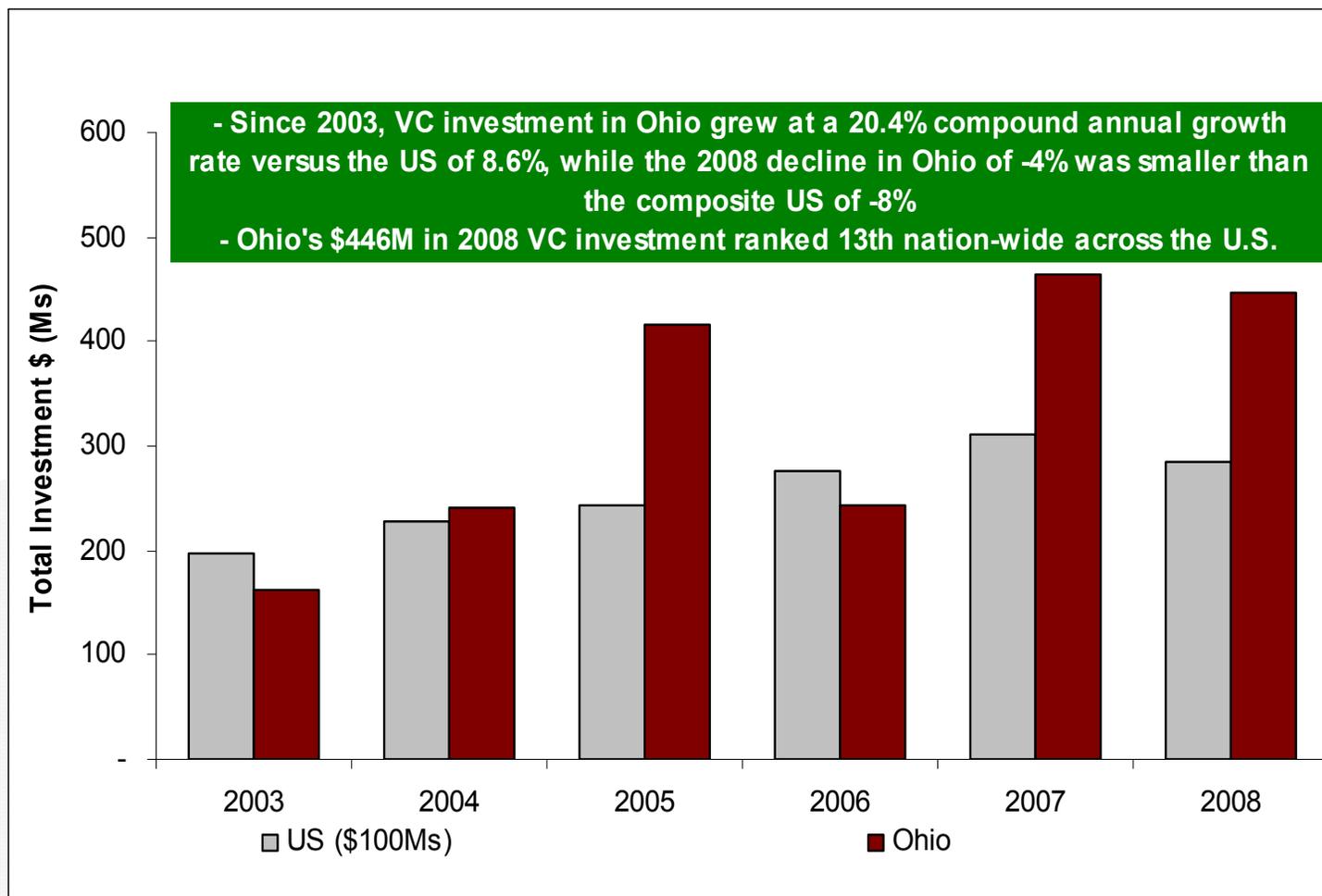
...with clear evidence that the clusters are gaining traction

Cluster		Change in Employment		Specialty Index		
		2002 to 2004	2004 to 2008	2002	2004	2008
Advanced Energy	Ohio	-5.2%	6.2%	1.09	1.15	1.26
	US	-8.5%	1.6%			
Advanced Materials	Ohio	-4.1%	-2.2%	1.71	1.74	1.91
	US	-4.1%	-6.1%			
Biomedical	Ohio	3.7%	6.9%	0.74	0.78	0.82
	US	0.2%	7.9%			
Instruments, Controls, and Electronics	Ohio	-7.9%	8.9%	0.60	0.60	0.67
	US	-6.1%	2.2%			
Power and Propulsion	Ohio	-6.9%	7.0%	1.85	1.90	1.99
	US	-8.0%	7.8%			

Note: A Specialty Index of 1.0 indicates a concentration of employment consistent with the national average. A reading above 1.25 indicates highly specialized.

5. Venture Capital

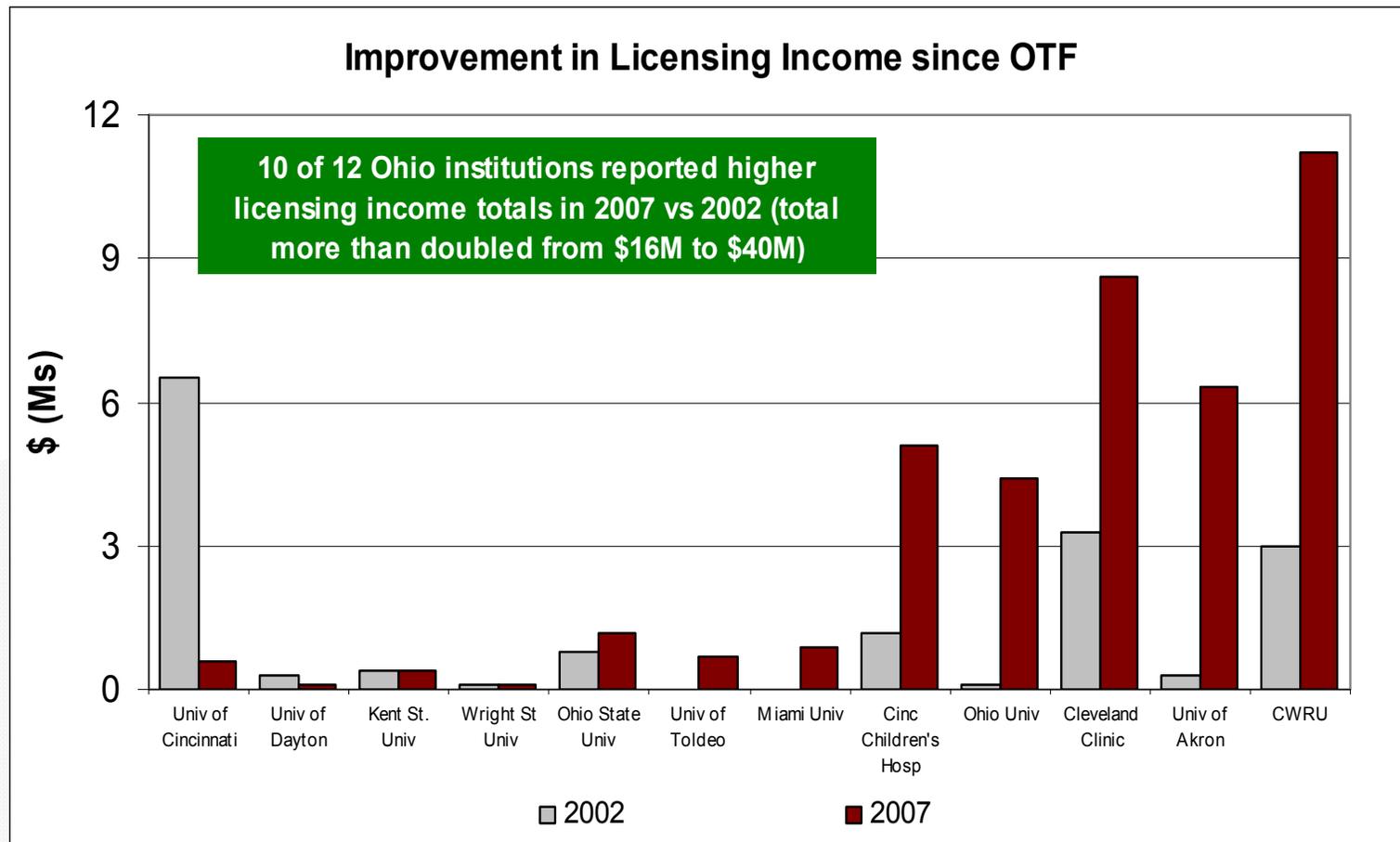
Venture capital investment in Ohio has grown rapidly over the last 5 years



Note: Defined as investment across Pre-seed/Seed, Early, and Later/Growth stages. Source: 2009 SRI "Making an Impact" report and OSU Fisher College of Business 2008 Ohio Venture Capital Report. US venture capital investment read in hundreds of millions of dollars.

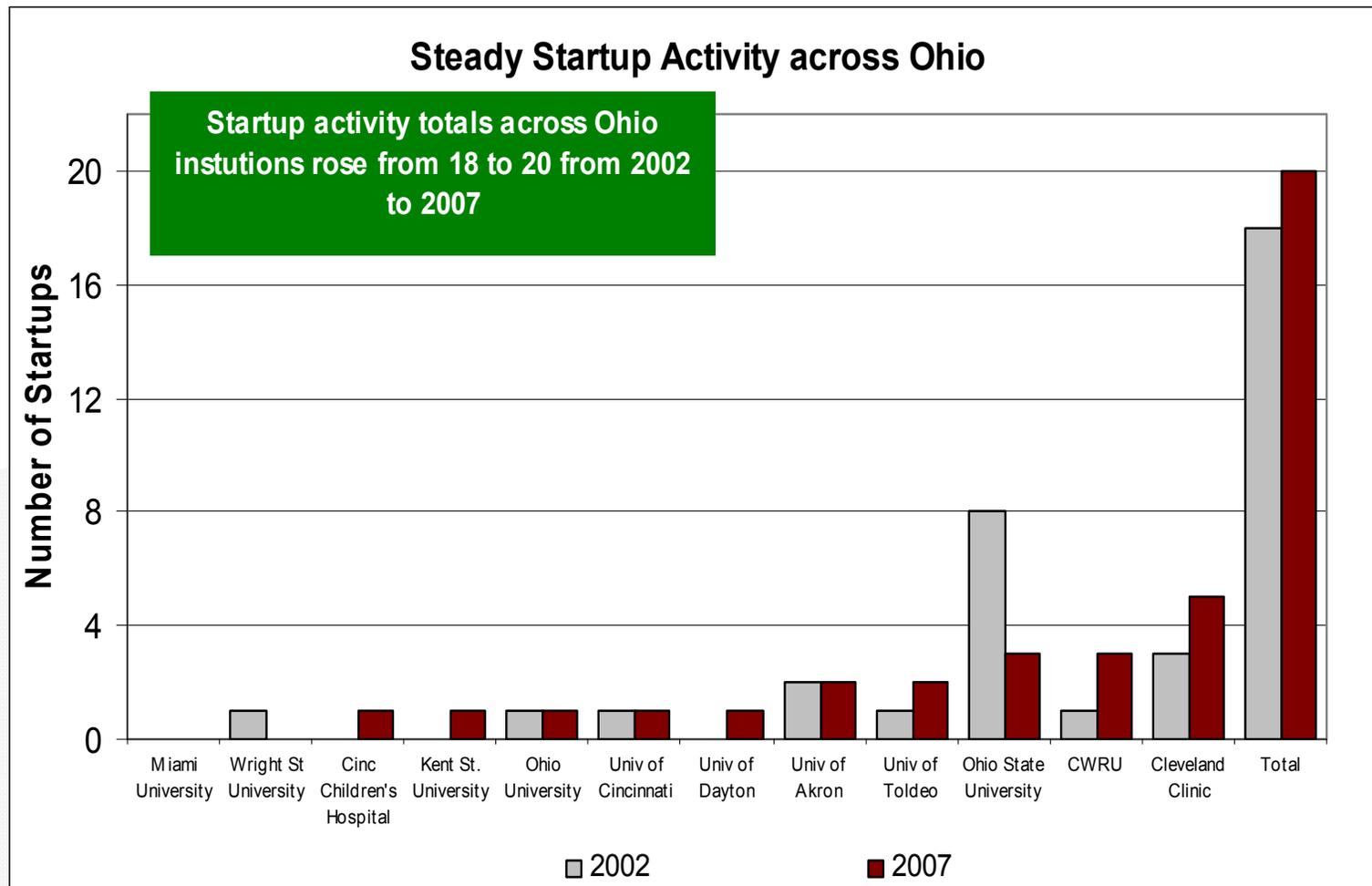
6. Technology Transfer

Tech transfer at Ohio universities and research institutions has increased substantially



Note: source 2009 SRI "Making an Impact" report and Association of University Technology Managers, 2007 Licensing Activity Survey

Company formation activity at Ohio universities and research institutions has grown 11% since 2002



Note: source 2009 SRI "Making an Impact" report and as Association of University Technology Managers, 2007 Licensing Activity Survey.

Lessons learned from OTF program to date include:

- Highly successful projects found to have the following key attributes:
 - Product orientation
 - Major commercial partner
 - Ohio supply chain
 - Sustainable competitive advantage
 - Strong leadership
- As investment portfolio has matured, it has made sense to “double-down” in key growth areas such as imaging, photovoltaics, and sensors
- Entrepreneurial company formation and growth requires support of both investment capital and services
- OTF success is a result of investing across the entire commercialization continuum (i.e., research leads to products which leads to companies which leads to investments which leads to growth which leads to sustainability)
- Commission and Advisory Board annual planning process ensures OTF is responsive and relevant to emerging needs and opportunities

Appendix

Summary Statistics / Assumptions

Measure (\$M's or #)	Actual:		Dec '06	Jun '07	Dec '07	Jun '08	Dec '08	Jun '09	Avg Change		CAGR
	Dec '05	Jun '06							per 6 mos	6 mos	Annual
OTF Investment <i>Cumulative</i>	115	28 143	47 190	49 239	52 291	52 343	60 403	70 473	51.2	22.5%	50.1%
Leverage (Follow On \$s)* <i>Cumulative</i>	704	75 779	500 1,279	490 1,769	234 2,003	606 2,609	310 2,919	313 3,232	361.1	26.2%	59.1%
Leverage Ratio (Cumulative)	6.1	5.4	6.7	7.4	6.9	7.6	7.2	6.8			
Direct Employment Added <i>Cumulative</i>	1,926	691 2,617	866 3,484	1,366 4,850	962 5,812	983 6,795	962 7,757	770 8,527	943	23.9%	53.6%
Total Impact Employment Added <i>Cumulative</i>	10,113	4,521 14,634	4,211 18,845	6,928 25,773	4,749 30,522	5,270 35,792	5,501 41,293	6,946 48,239	5,447	24.2%	54.3%
Product Sales <i>Cumulative</i>	52	116 168	53 221	110 331	66 397	94 491	163 654	220 874	117.4	41.4%	100.1%
Companies Created <i>Cumulative</i>	116	97 213	42 255	117 372	11 383	83 466	48 514	57 571	65.0	23.0%	51.3%
Tax Revenues (Annualized):	2005		2006		2007		2008	2009E	Avg per year		
State Income Tax - Direct <i>Cumulative</i>	4.8		5.9 10.8		10.8 21.6		15.6 37.2	19.7 56.9	11.4		
State Income Tax - Total Impact <i>Cumulative</i>	17.5		24.3 41.8		42.3 84.2		60.7 144.8	82.8 227.6	45.5		
State Sales Tax <i>Cumulative</i>	2.9		9.3 12.2		9.7 21.8		14.1 36.0	24.2 60.2	12.0		
Return:											
Run Rate - (Direct Inc plus Sales Tax Rev)/Avg OTF Invest <i>Cumulative - Return of Investment (Direct)</i>	8.0% 6.7%		10.0% 12.1%		8.5% 14.9%		8.6% 18.2%	9.3% 20.1%	8.9%		
Run Rate - (Total Inc plus Sales Tax Rev)/Avg OTF Invest <i>Cumulative - Return of Investment (Total Impact)</i>	21.3% 17.7%		22.0% 28.4%		21.6% 36.4%		21.6% 44.9%	22.6% 54.9%	21.8%		

* Excludes product sales

Note: State income and sales tax revenues calculated at 3.4%-Direct / 3.1%-Indirect (State of Ohio Tax Tables) and 5.5%, respectively.