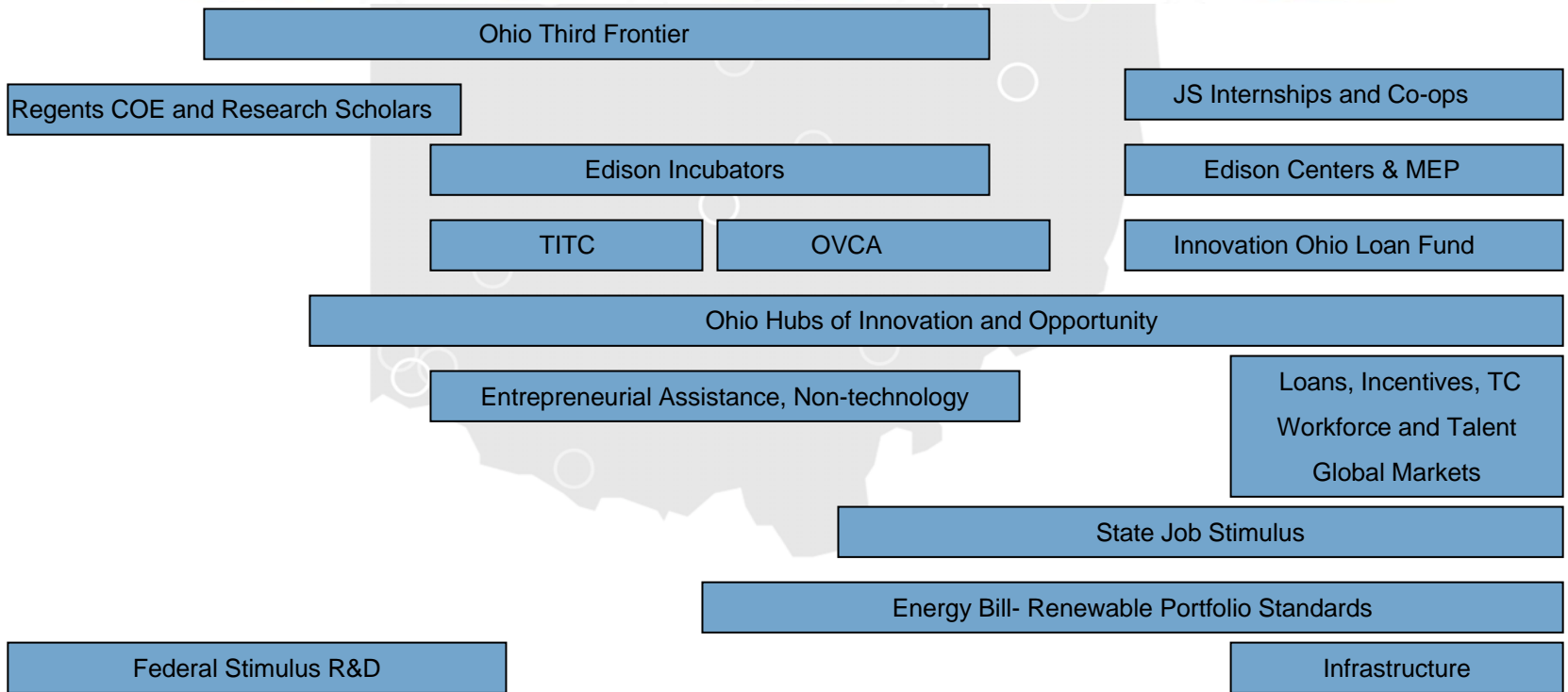
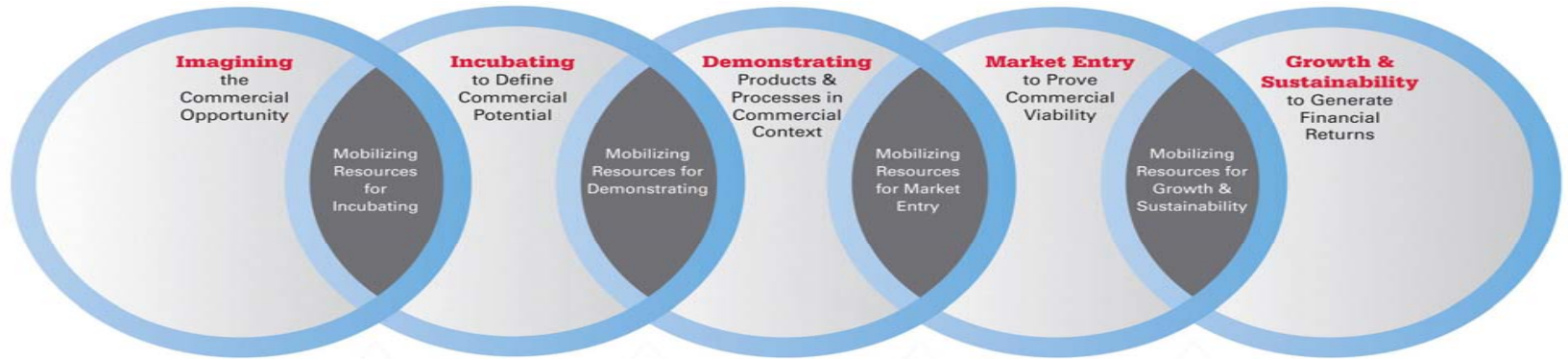




**Ohio Third Frontier Retreat
February 25-26, 2009**



Evolution of Ohio Third Frontier

OTF has shown the ability to evolve its programmatic elements to insure relevancy to the changing economic landscape of the State while at the same time staying true to the original vision:

In targeted areas of technology, Ohio has established regional and statewide clusters of excellence that sustain our global competitive advantage in company and product formation, job creation and economic growth.

Evolution of Ohio Third Frontier

The evolution of the program has been driven by four key forces:

- Funding sources
- Policy directives
- Success in building the commercialization continuum pipeline
- Adoption/integration of lessons learned/best practices

Evolution of Ohio Third Frontier: Funding Sources

Original OTF funding sources significantly restricted the strategic direction and programmatic emphasis:

- The Wright Capital Fund was the major single source of funding; strongly skewed investment toward university-based research and commercialization programs having a significant capital requirement
- Biomedical Research and Technology Transfer Trust Fund was the source of the majority of operating dollars and was restricted to use for biosciences projects

Evolution of Ohio Third Frontier: Funding Sources

With the passage of the ballot initiative in 2005, OTF was infused with a significant source of operating funds having no programmatic restrictions on its use:

- Balance the deployment of operating and capital dollars
- Balance support of engineering & physical sciences and bioscience
- Increase support for entrepreneurial assistance and capital formation

Evolution of Ohio Third Frontier: Funding Sources

Tobacco securitization has created challenges in balancing support for engineering & physical sciences and biosciences going forward

In 2009, Budget Bill included \$50 million more than original legislative spending plan for Third Frontier Research and Development Fund; Board and Commission approved a 4-year spending plan that mitigated this change and created a stable and balanced budget approach to carry OTF through 2012

Evolution of Ohio Third Frontier: Policy Directives

- 
- Fuel Cells
 - Advanced Energy
 - Ohio Research Scholars
 - Legislative requirement to add six regional representatives to Third Frontier Commission
 - Biomedical & Bioproducts JS programs associated with OTF through Commission and two new advisory boards

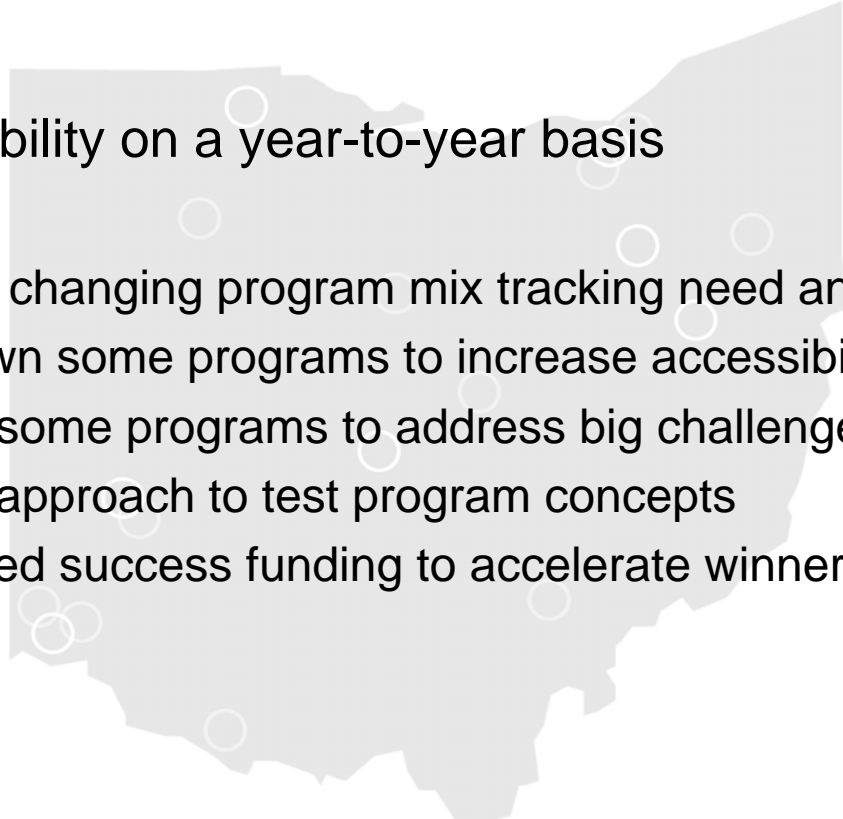
Evolution of Ohio Third Frontier: Pipeline

- Adoption of commercialization framework provided a commonly understood approach to strategy, tactics and performance tracking
- Strategy driven by understanding of critical gaps (incubating, demonstrating)
- Program design and performance defined by positioning in the framework
- Growing understanding of need to balance programming across framework
 - Adding Third Frontier Internship Program
 - Adding company attraction
 - Integrating other TBED initiatives and recent Job Stimulus activities

Evolution of Ohio Third Frontier: Lessons Learned

- Criteria for scientific and technical merit balanced with increasingly rigorous requirements for defining viable commercialization plan and industry collaboration
- Highly successful projects found to have some key attributes including:
 - Specific focus
 - Product orientation
 - Major commercial partner
 - World-class recognition
 - Ohio supply chain
 - Sustainable competitive advantage
 - Strong leadership
- Metrics refined to focus less on activity/process (C metrics) and more on tangible evidence of transitions (A and B metrics) from one level of the framework to another

Evolution of Ohio Third Frontier: Lessons Learned

- Program flexibility on a year-to-year basis
 - Constantly changing program mix tracking need and opportunity
 - Scaled down some programs to increase accessibility
 - Scaled up some programs to address big challenges
 - Used pilot approach to test program concepts
 - Implemented success funding to accelerate winners
- 

Evolution of Ohio Third Frontier: Lessons Learned

- Entrepreneurial company formation and growth requires support of both investment capital and services; pipeline strategy critical
- Concentrations of awards in technology sub-categories have emerged and may suggest directions for greater investment focus and cluster development
- Individual award decisions can be made stronger by considering the context of projects, including past performance, fit with previous investments and other relevant business intelligence

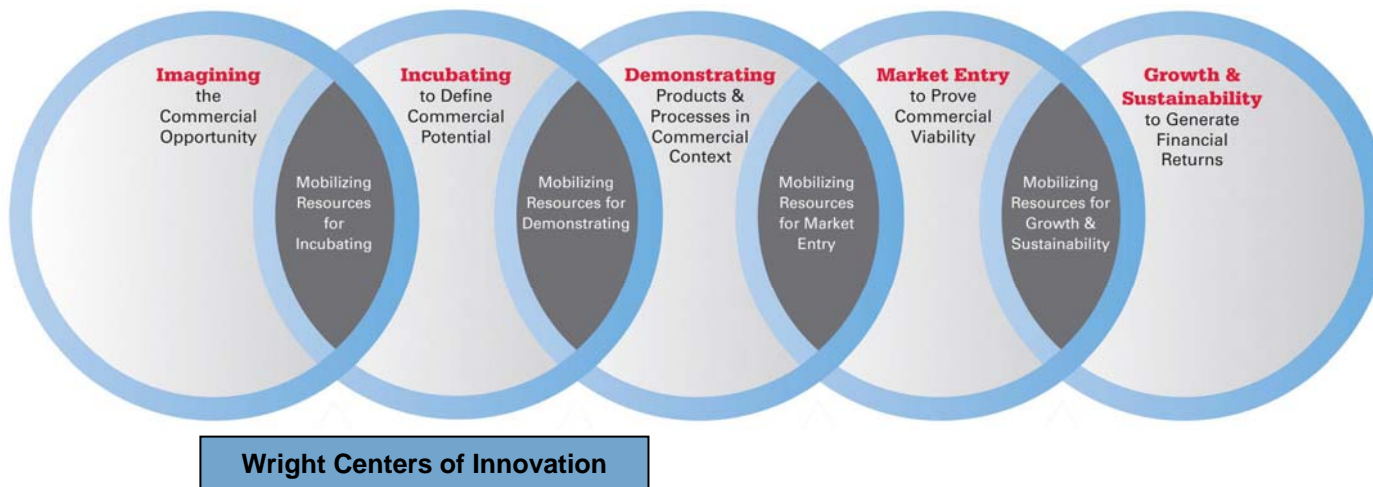
A light gray silhouette of the state of Ohio is centered on the page. Overlaid on this map are approximately 15 white circles of varying sizes, representing the locations of research centers or Centers of Excellence. The circles are scattered across the state, with a notable cluster in the northeast and another in the southwest.

Research/ Centers of Excellence

Research/Centers of Excellence

Purpose of Discussion

Obtain input about the future directions of Ohio Third Frontier's Wright Centers of Innovation Program and the general concept of centers of excellence to achieve research and commercialization goals of Third Frontier





Regent's Material

Purpose of Wright Centers

- Support large-scale, world-class, and collaborative research and technology development platforms to accelerate commercialization in Ohio

Evolution of Wright Centers

- Centers awarded on the basis of the quality of science to balance of science and Ohio industry relevance and impact
- Funded primarily by physical capital to funded by a balance of physical capital and operating funds
- Experiment with Mega-centers to quickly achieve scale in areas of national/international prominence.

Wright Center Background

- \$295 million awarded to 13 Wright Centers and Mega-Center
 - \$148 million in Engineering
 - IDCAST – sensors
 - PVIC – photovoltaics
 - OBIC – bioproducts
 - CMPND – polymer nanomaterials
 - OCAPP – aircraft turbines
 - WFCG– fuel cells
 - WCSSE – sensors
 - daytaOhio--IT
 - \$147 million in Biomedical
 - GCIC – cardiovascular
 - AFIC – atrial fibrillation
 - CMC – bioinformatics
 - MIE – imaging
 - CSCRM– stem cell

Performance Expectations

- Leverage State funding
 - Research funding from both government and industry
 - License income from inventions
 - Product sales by companies commercializing technology
 - Equity investments in companies commercializing technology
- Develop new technology-based opportunities
 - Knowledge that accelerates technology development and commercialization
 - Applications for new technologies
 - Products derived from technologies and knowledge
- Company formation, attraction, collaboration
- Creation of high-salary, employment opportunities

Wright Centers of Innovation Performance

Category	Number for Wright Centers	% of Ohio Third Frontier Total
State Funds Awarded	\$295,407,423	33%
State Funds Expended	\$156,793,474	39%
Federal & State Research Funding	\$550,310,898	42%
Industrial Research Funding	\$60,033,461	19%
License Income	\$620,897	11%
Product Sales	\$87,796,735	15%
Follow On Investments & Other	\$110,790,097	10%
Patents Issued & Pending	145	15%
Company Formation	78	15%
Jobs Created – Research & Development	973	27%
Jobs Created – Manufacturing & Production	687.5	43%
Jobs Created – Administrative & Other	160	11%
Average Salary	\$77,900	115%

Vision For Wright Centers

- Have obtained or maintained national and international prominence
- Be large in terms of scope, outreach and economic impact
- Be strongly industry driven and funded
- Function in an inter-institutional manner with true integration
- Employ effective and innovative technology transfer models and techniques
- Build strong connections to commercialization resources including incubators, capital funds, prototyping and mfg. scale-up facilities
- Become sustainable without continuous State investment

Performance Against Vision

Vision	Success Examples
National/International Prominence	GCIC, AFIC, MIE, PVIC, CMPND
Large in scope, outreach, impact	No “explosive” growth
Strong industry drive and funding	CMPND, OBIC, IDCAST, MIE
Integrated inter-institutional collaborations	Mostly project oriented not systemic
Effective and innovative technology transfer	GCIC, AFIC, IDCAST, MIE, CSCRM, PVIC
Strong connections to commercialization resources	PVIC, GCIC, AFIC, IDCAST
Sustainable without continuous state investment	None has achieved full sustainability

Other Center Models

- Georgia Research Alliance—investment in research infrastructure and endowed chairs within universities in an effort to attract high-profile national centers and awards
- Utah—investment in a large number of relatively small Centers and let market determine success
- New York/Texas—creation of a few large Centers
- Applications Centers—creation of Centers such as Edison Welding Institute

Future Directions Discussion

- **Should we continue to pursue research and commercialization goal through a formal centers of excellence model like Wright Centers and, if so, are there new guiding principles that should be adopted?**
- **Should new centers be chosen to fulfill specific targeted needs or emerge from open competitions?**
- **Should we reward success of currently funded centers with additional state support?**
 - based on continuous progress toward vision
- **What should we do with investments that do not appear to be on a success track?**

Performance Statistics

Wright Center	State Funds Awarded	State Funds Expended	Leverage Ratio	Co-investment & Leverage	Jobs Created & Retained	Companies Created & Relocated	Patents Issued & Pending
Medical Imaging	\$17,114,362	\$16,707,052	6.17	\$103,016,101	366	7	25
Stem Cell	\$19,497,685	\$19,455,240	4.99	\$97,069,048	70	4	1
Fuel Cell	\$19,665,044	\$17,921,582	1.04	\$18,641,048	88	4	8
Computational Medicine	\$27,701,076	\$25,180,769	6.57	\$165,314,000	197	3	11
Advanced Data Management	\$12,603,750	\$8,315,691	1.91	\$15,871,806	218	13	2
Aircraft Engines	\$11,270,000	\$11,270,000	9.76	\$109,994,183	179	0	0
Atrial Fibrillation	\$23,000,000	\$13,670,636	2.94	\$40,158,599	79	7	17
Bioproducts	\$11,589,847	\$7,538,468	9.73	\$73,332,092	52	9	41
Nanomaterials	\$22,489,845	\$13,916,201	3.21	\$44,711,874	87	3	26
IDCAST	\$28,000,000	\$8,972,323	5.40	\$48,431,433	247	2	1
Photovoltaic	\$18,635,238	\$2,721,115	24.76	\$67,380,931	145	2	1
Sensors	\$23,840,576	\$1,998,750	0.80	\$1,594,473	30.3	2	1
Cardiovascular	\$60,000,000	\$9,125,647	2.63	\$24,036,500	62	22	11



Capital And Entrepreneurial Assistance

Capital And Entrepreneurial Assistance

Paul Cohn (Moderator), VP, Fort Washington Capital Partners Group

John Huston, Chairman, Angel Capital Association

Mark Richey, Managing Director, Draper Triangle Ventures

Ray Leach, CEO, JumpStart

Phil Brennan, COO, reXorce Thermionics

Wayne Poll, Founder and Chairman, Minimally Invasive Devices

A light gray silhouette of the state of Ohio is centered in the background. It contains several small, white, semi-transparent circles of varying sizes scattered across its surface.



Cluster Development

Cluster Development Panel

Rodger McKain, VP, Rolls-Royce Fuel Cell Systems

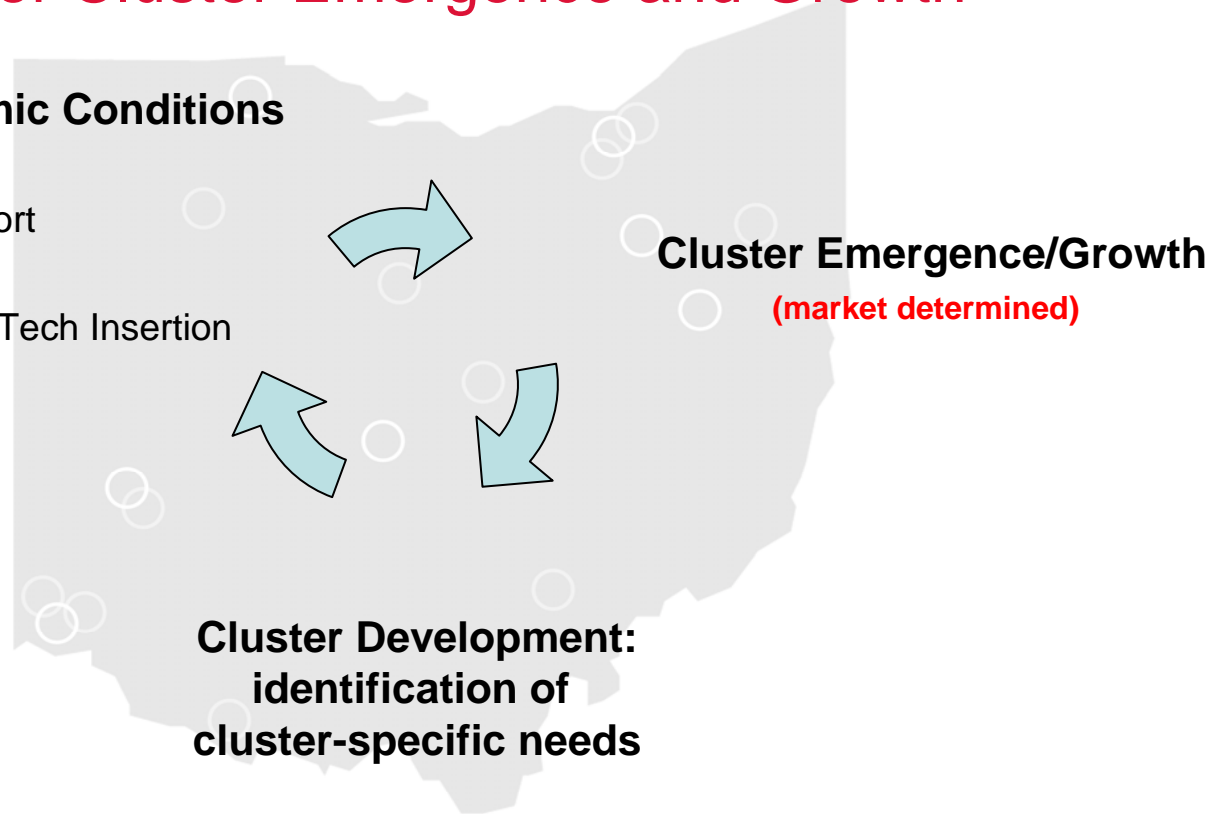
Alvin Compaan, Distinguished University Professor
Of Physics, University of Toledo

Deborah Cummings (Moderator)

Ohio Third Frontier Creates A Virtuous Cycle For Cluster Emergence and Growth

Promotion of Economic Conditions

- Knowledge Creation
- Entrepreneurial Support
- Capital Formation
- Product Innovation & Tech Insertion
- Company Attraction
- Workforce



Cluster Definition

- A concentration of similar, related or complementary firms and economic actors and institutions that are located near one another with:
 - Active channels for business transactions
 - Strong communications and dialogue
 - Shared specialized infrastructure, labor markets and services
 - Comparative advantage drawn from their mutual proximity and connections.

Key Success Factors in Developing an Industrial Cluster

- Accessible and relevant **research**/innovation aligned to industrial needs
- **Linkage** between technology providers and product developers
- Availability of **intellectual capital**/talent/tacit knowledge
- Anchor companies/**industry leaders**/traditional industrial strengths
- **Synergies** with existing manufacturing infrastructure
- **Entrepreneurial** energy/degree of technology spill-over
- **Supply chain** - proximity of related industries, suppliers, services and buyers
- Accessibility of **financial capital**
- Availability of **skilled workforce** with adaptable skills
- Availability of specialized assets/**physical infrastructure**
- Advanced **networking/communications** among relevant cluster players
- Committed cluster **leadership**

Purpose of Cluster Development Discussion

Discuss current views of technology-based economic clusters, and the potential value of systematic investments in existing and emerging clusters to grow and accelerate sustainable economic activity in areas of clear technological strength.

Some of the ideas will be viewed and tested through a discussion of the experiences of the fuel cell cluster in Ohio and the rapidly emerging photovoltaics cluster.



2010 Program Plan and Budget

Third Frontier Funding Sources

- **Third Frontier Research and Development Fund** (voter approved bond)
- **Wright Capital Fund** (Higher Education Capital Improvement bond)
- **Biomedical Research and Technology Transfer Trust Fund** (Tobacco settlement)
- **Third Frontier Action Fund** (General Revenue Fund)

FY 2010 Budget Appropriations

FY 2010	TFRDF	WCF	BRTTTF	TFAF	TOTAL
FY 2010 APPROPRIATION	\$61,000,000	\$50,000,000	\$0	\$4,000,000	\$115,000,000

Third Frontier Action Fund (TFAF) is a general revenue line item and was reduced by \$11. All funds remaining in this line are for administrative support of the Ohio Third Program

TFRDF has \$11 million in accelerated spending to offset reduction in TFAF

Wright Capital Fund (WCF) pending approval of FY 09-10 Capital Bill request

Biomedical Research and Technology Transfer Trust Fund (BRTTTF)- no identified replacement for funding lost to securitization

Research Programs

- **Research and Commercialization Program (RCP)**
 - Insufficient operating funds to support both biomedical and engineering & physical sciences as separate pots of dollars at historical levels of \$22-25 million/ technology area
 - With \$22 million in proposed budget, options include:
 - Alternating years of just biomedical or E&PS with 2010 being exclusively for the latter
 - Single competition for all technology focus areas

Research Programs

- **Wright Projects (WP)**
 - Pipeline of good projects appears strong enough to support a 2010 RFP. Efforts still being made to encourage participation of smaller institutions, especially two-year colleges.



Research Programs

- **Wright Center Success Fund (New)**
 - Pilot project of up to \$4 million to provide funding for selected activities of successful Wright Centers. Eligible centers must demonstrate both performance and need.
 - Success defined by commercialization metrics including licensing revenues, companies formed and capitalized, industry sponsored R&D; attraction of federal research funding important but not sufficient to claim success.
 - Up to \$1 million to be spent over no more than 24 months; 1:1 cost share; major focus on operational expenses not typically covered by other sources including salary for Executive Director, marketing/promotion, patent/licensing costs.

Research Programs

- **New Research and Development Attraction Fund**
 - Modification of New Research and Development Center Cost Share Program
 - Capital only
 - Flexible funding for:
 - Attraction of federal or other competitive centers of excellence with award values greater than \$5 million that build on existing areas of OTF concentration or represent major new platforms relevant to one more targeted industry sectors
 - Targeted company attraction packages, providing access to funds that companies can direct to establish significant research partnerships with selected universities and medical centers; complementary to Target Industry Attraction grant program and other Development incentives

Entrepreneurial Assistance

- **Success and Pre-seed Fund**

- Widely reported near-term capital gap downstream from pre-seed; closely monitor current portfolio for trends in follow-on rounds of funding to determine advisability of capitalizing additional pre-seed fund activity.
- Even if trends are generally positive, consider only re-investment in existing funds with solid A metrics.
- Continue to offer success funding for entrepreneurial assistance services associated with existing ESPs.

Cluster Development

- **Third Frontier Fuel Cell Program**
 - Pipeline of good projects appears strong enough to support a 2010 RFP.
- **Third Frontier Advanced Energy Program**
 - Pipeline of good projects appears strong enough to support a 2010 RFP.

Question as to whether these two programs remain separate or a single advanced energy RFP be released requiring fuel cell projects to compete against all other advanced energy categories?

Cluster Development

- **Targeted Industry Attraction**
 - Continues to be a useful tool combined with other Development incentives to attract technology-based companies in OTF focus areas.



Product Innovation

- **Ohio Research Commercialization Grant Program**
 - Continue to offer as accelerated market entry funding for companies competing successfully for SBIR Phase II awards that build on existing areas of OTF concentration
 - Allow OTF portfolio companies (that qualify as small businesses) to compete subject to significant progress and performance on previous OTF awards and with the understanding that this represents terminal OTF grant funding for the product or products bid

Workforce and Talent

- **Third Frontier Internship Program**
 - High demand and substantial evidence that internships are regularly transitioning to full-time positions with sponsor companies
 - Continuing dialog on how to coordinate TFIP with new Regents JS Internship/Co-op Program