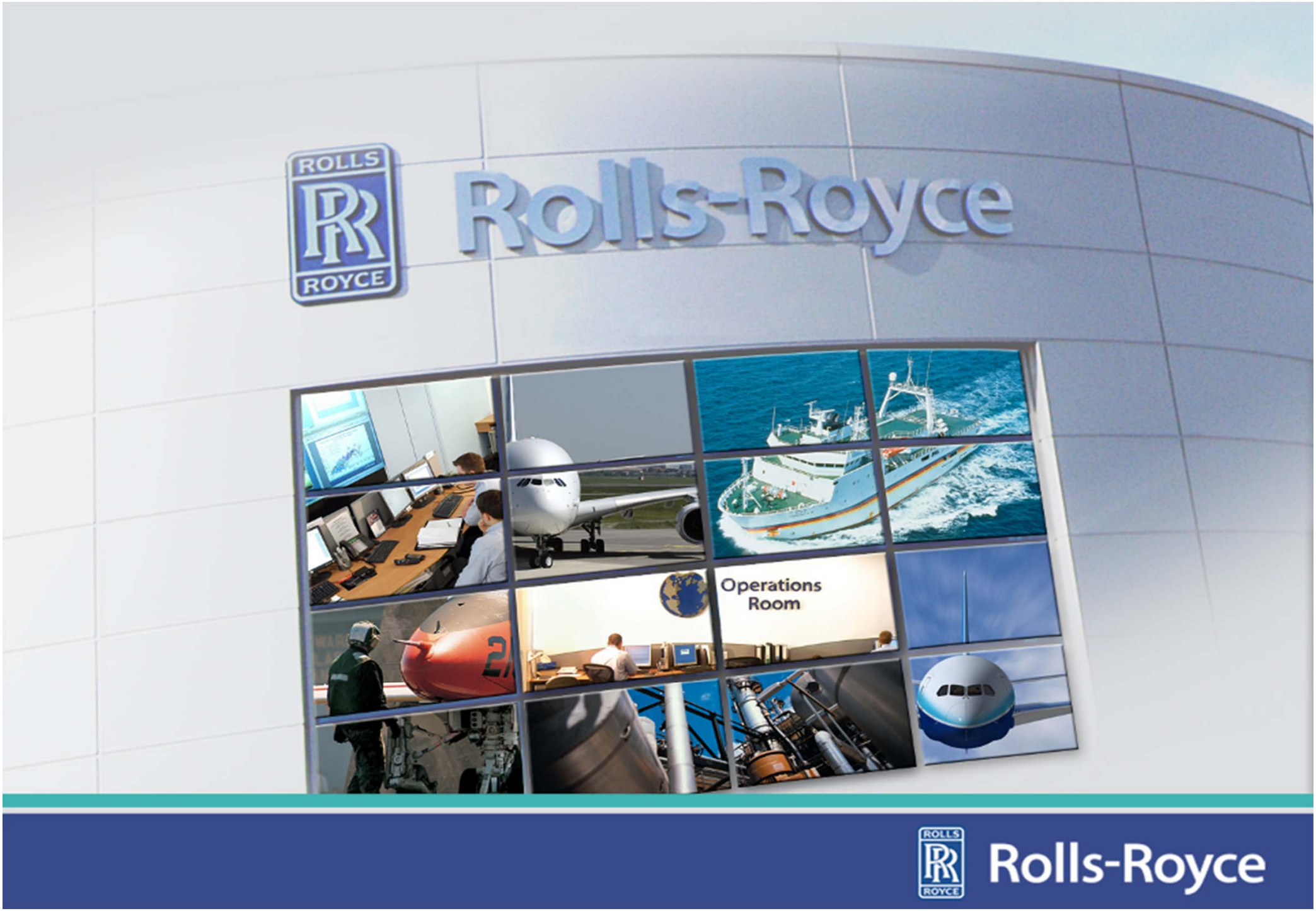

ROLLS
ROYCE
Rolls-Royce
Operations
Room
ROLLS
ROYCE
Rolls-Royce

Our heritage

Our past …

…our future

Addressing four global markets

Power systems for:

Civil Aerospace
US$1,250B

Wide-bodied jets

Narrow-bodied jets

Corporate & Regional

Defense Aerospace
US$480B

Military aircraft

Helicopters

Marine
US$350B

Commercial

Naval

Energy
US$120B

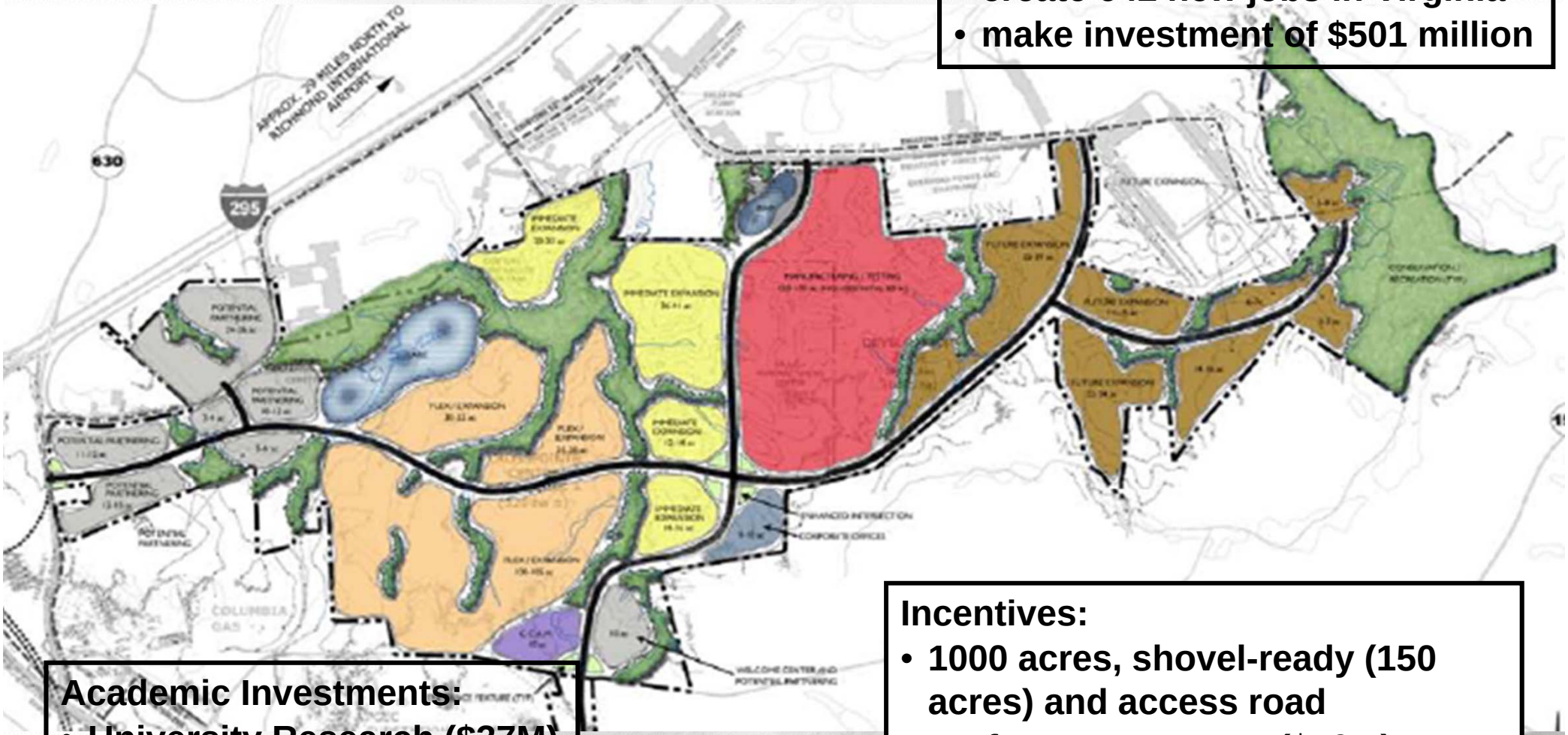
Oil & Gas

Power generation

A 20-year global market opportunity for products and services worth around US$2 trillion

Crosspointe Site

Rolls-Royce will:
- **create 642 new jobs in Virginia**
- **make investment of $501 million**



Academic Investments:
- **University Research ($37M)**
- **Community Colleges ($2M)**

Incentives:
- **1000 acres, shovel-ready (150 acres) and access road**
- **Performance grants ($40M)**
- **Training Grants ($9M)**

Rolls-Royce

Plans for Crosspointe Site

Component Mfg. Factories

Research Facilities – CCAM & CCAPS

[redacted]

Supplier Park

Engine Assembly & Test

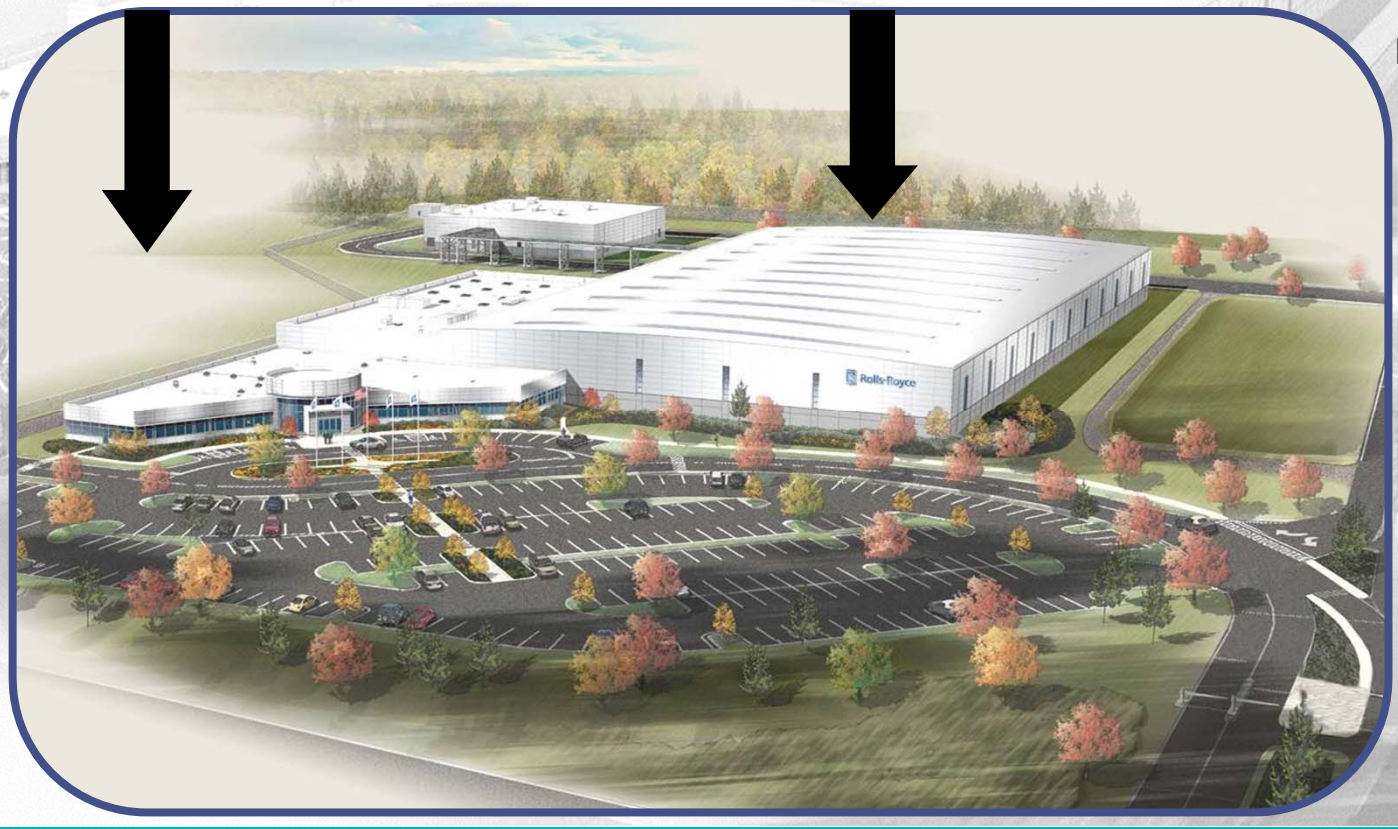
Blisk Facility

- Factory design and layout underway
- Size approx 165,000 ft²
- Employment circa 170 persons
- $190m project
- Contingent on F136 Program

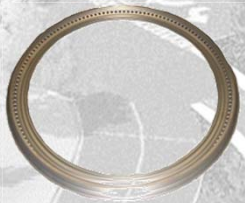
Disc Facility

- Factory design and layout complete
- Size approx 200,000 ft²
- Employment circa 140 persons
- $172m Project
- Construction completion Q4 2010

Blisk Building Parts



Disc Building Parts



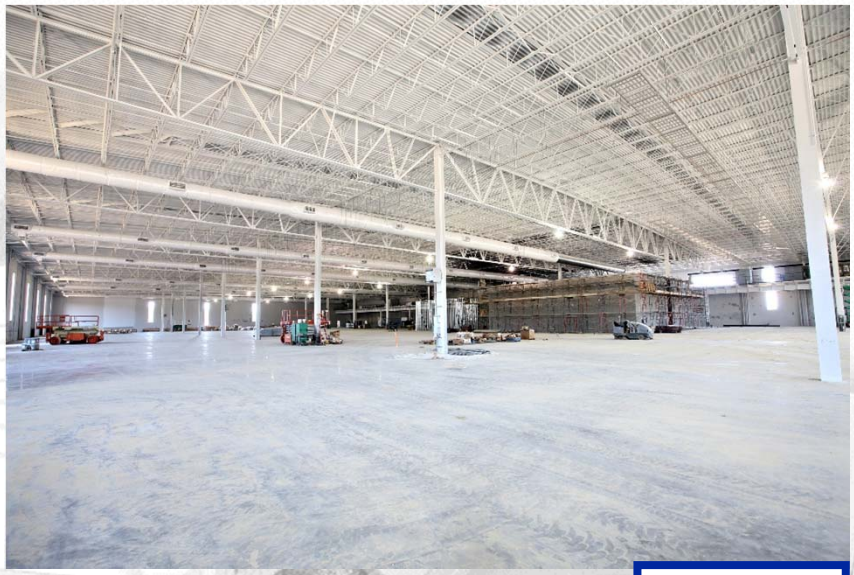
Factory Skills Required

- **Precision Metal Machining**
  - 5 Axis Computer Numerical Control (CNC) Operation
  - Horizontal Milling and Vertical Turning
  - In-cycle Probing for Quality
  - Coordinate Measuring Machine Inspection
  - Multi-Axis Grinding
- **Non Destructive Testing**
  - Binocular Inspection
  - Fluoride Penetrate Inspection
  - Chemical Etching
- **Manufacturing Engineering**
- **Design Engineering**
- **Aircraft Engine Mechanics**

Underway and having impact in the Commonwealth

Progress 2010

February



August

February
$14M Invested
45 On Site

April
$21M Invested
93 On Site

June
$35M Invested
124 On Site

August
$46M Invested
161 On Site

Rolls-Royce Direct Impact

- **Employment in The Commonwealth**
  - 88 new hires as of 5/13/2010 filing
  - 12 additional new hires through 9/20/2010
  - 40 rotational hires and interns from VA Schools since 2008

- **John Tyler CC Development**
  - Making a start
  - Lab expansion underway
  - New machine tool purchased and installed Q4 2010
  - Curriculum modification underway
  - Much more work needed to achieve advanced manufacturing ready work force

The Commonwealth Center for Aerospace Propulsion Systems (CCAPS)

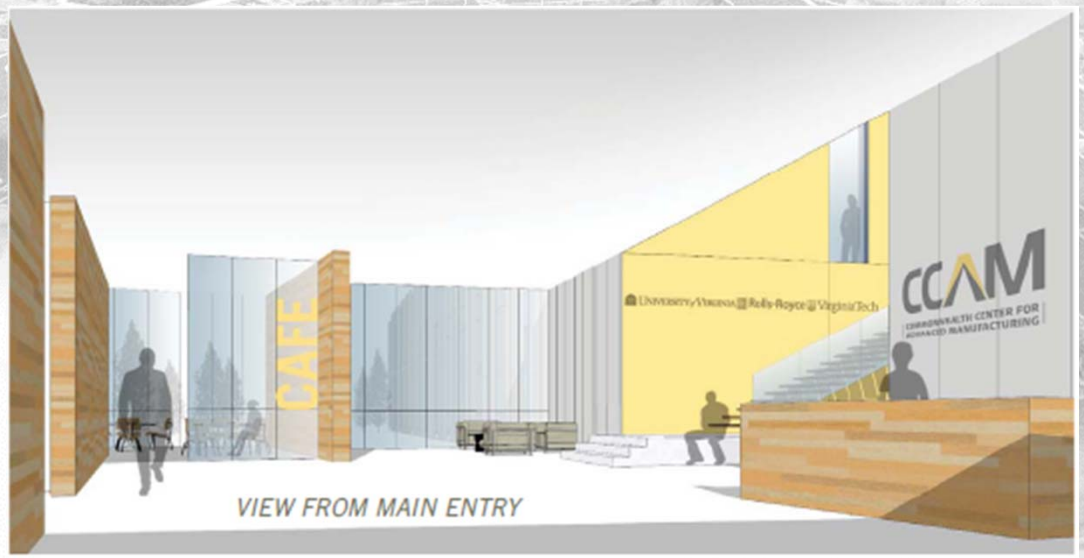
- Virtual research at UVA and VT
- Research centered around surface engineering, power electronics, flow control, other specific projects
- Lab renovations underway at UVA and VT
- 3 full time professors hired and more in process
- Seven (7) projects initiated in 2010, $1.6M in value
- Rolls-Royce is in the process of donating:
  - Flow cascade and burner rig for Flow Control testing at VT
  - Trent 1000 engine for display at VT
  - Viper engine for classroom educational use at UVA
  - RB 211 compressor stack for classroom educational use at UVA

Establishing an important research asset for the Commonwealth

Commonwealth Center for Advanced Manufacturing

- **General**
  - Physical applied research at CCAM facility
  - Multiple industry members partnered with multiple universities
  - Research centered around surface engineering and manufacturing systems
  - CCAM now a Virginia non-stock corporation
  - 10 year business plan, Governance and IP structure in place
- **Building**
  - Rolls-Royce transferred 20 acres to University of Virginia Foundation
  - Design firm Perkins + Will engaged, CCAM opening by end 2011
- **Marketing**
  - Engaged local marketing firms Hodges Group and CRT/tanaka
  - Farnborough and International Manufacturing Technology Shows
  - 5 co-founding members to be on board by end of September
  - Web site established www.ccam-va.com

Leveraging the economic and workforce impact of CCAM



- Proposal being prepared for the Virginia Tobacco Commission
- Proposals submitted for NIST and EDA grants

Planned CCAM Growth

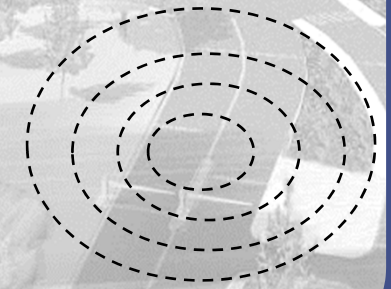
	2010	2013	2019
Members	1	15	30
Staff	(2)	(44)	(154)
Revenue	$0.2M	$4.9M	$15.9M

Establishing an important research asset for the Commonwealth

Workforce Development is Critically Important

- Advanced manufacturing requires exceptional technical skills within a high performing framework.
- Partnerships with community colleges, universities, governments and related industry associations are key.
- Pathways need to begin pre-secondary education with a STEM emphasis.
- Current partnerships and workforce availability data support phase I aspirations but limit future growth.
- Additional programs are needed that are innovative, flexible and relevant.
- These programs will promote manufacturing as an attractive career path.

Occupation Code	Title	Employment 20 Miles	40 Miles	60 Miles	Tota
Machinists					
514041	Machinists	690	210	1,240	2140
Metal Workers					
514011	Computer-Controlled Machine Tool Operators, Metal	150	50	220	420
514021	Extruding and Drawing Machine Setters, Operators,	150	20	100	270
514022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	<10	<10	60	60
514023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	100	10	190	300
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	580	180	540	1300
514032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	30	<10	170	200
514033	Grinding, Lapping, Polishing, and Buffing Machine	90	30	90	210
514034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	40	10	80	130
514035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	20	<10	20	40
514072	Molding, Coremaking, and Casting Machine Setters,	280	70	190	540
514081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	110	20	140	270
514111	Tool and Die Makers	70	10	140	220
514121	Welders, Cutters, Solderers, and Brazers	690	240	1,290	2220
514122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	90	20	120	230
514191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	50	10	110	170
514193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	40	10	30	80
514199	Metal Workers and Plastic Workers, All Other	90	<10	30	120
Engineers					
172071	Electrical Engineers	620	60	570	12
172141	Mechanical Engineers	630	90	1,000	



Typical Training Center

- Basic Machining
- Separate Textbook Training
- Outdated Equipment
- No IT Integration
- **Layout does not recognize today's requirements**

Advanced Career Center

- Simulates modern manufacturing environment
- Advanced equipment with broad application
- Integrated IT systems
- Lean, flow cell environment
- **Relevant training for a modern workforce**

Summary

- Our Commitment has Powered Through an Economic Storm
- Significant Investments and Hiring are In Process and Continuing
- We are Building a Research and Economic Engine for the Future of the Commonwealth
- An Opportunity to Further Leverage through Workforce Development and CCAM Funding

A Relationship; Not A Transaction