

Boston University

 **Northeastern**

Update on the Massachusetts Green High Performance Computing Center

A Briefing for
Holyoke Innovation District Design and Development Task Force

April 8th, 2010

Vision: MA Green HPCC is envisioned to be....

- ❑ A world-class high performance computing center using green energy, green facilities design, and serving as a showcase for concepts of “green computing.”
- ❑ A facility designed to strengthen the state’s leadership role in the development and application of advanced computing to key R&D areas such as the life sciences, clean energy, and climate change.
- ❑ A center that would serve as a catalyst for the development of the Holyoke Innovation District and the IT industry in Western Massachusetts and throughout the Commonwealth, with economic, educational and workforce development benefits.
- ❑ A collaborative partnership among a consortium of four leading research universities (MIT, UMass, Boston University, and Northeastern University), the Commonwealth of Massachusetts, EMC and Cisco, and potentially others in the future.

Why Holyoke? – Low Cost, Green Resources



Low-cost, green energy

Holyoke Gas & Electric to buy 270 acres on Mt. Tom

by The Republican Newsroom
Tuesday March 17, 2009, 5:42 PM



enabling
infrastructure

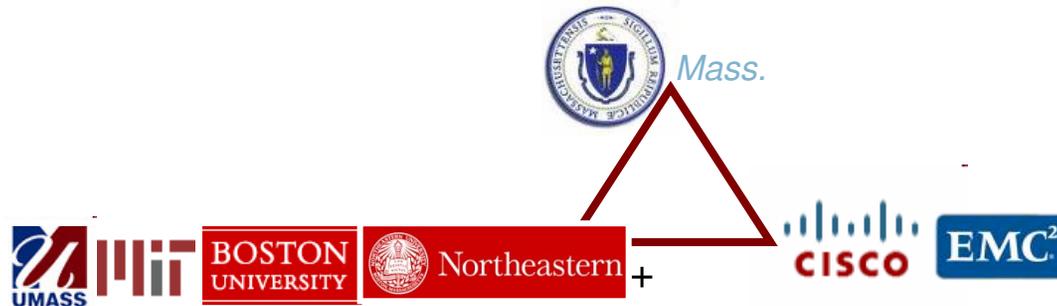
Holyoke infrastructure:

“ping, power, pipe, permitting”

- ❑ *power*: hydro, wind (future), other contracted
- ❑ *ping (networking)* near gigabit backbone Xroads
- ❑ *pipe*: cooling options
- ❑ *permitting*: economic zone, incentives

Massachusetts *Green* High Performance Computing Center

❑ *historic university-government-industry collaboration:*



- strengthening MA leadership in computing, application in life sciences, clean energy, climate

❑ *world-class "green" HPC center*

- computation as 3rd leg of science
- required 21st century research infrastructure
- green: power, facility & operations, research

❑ *catalyst:* Holyoke energy innovation district - economic, educational, workforce dev. benefits to Holyoke, Western MA, State

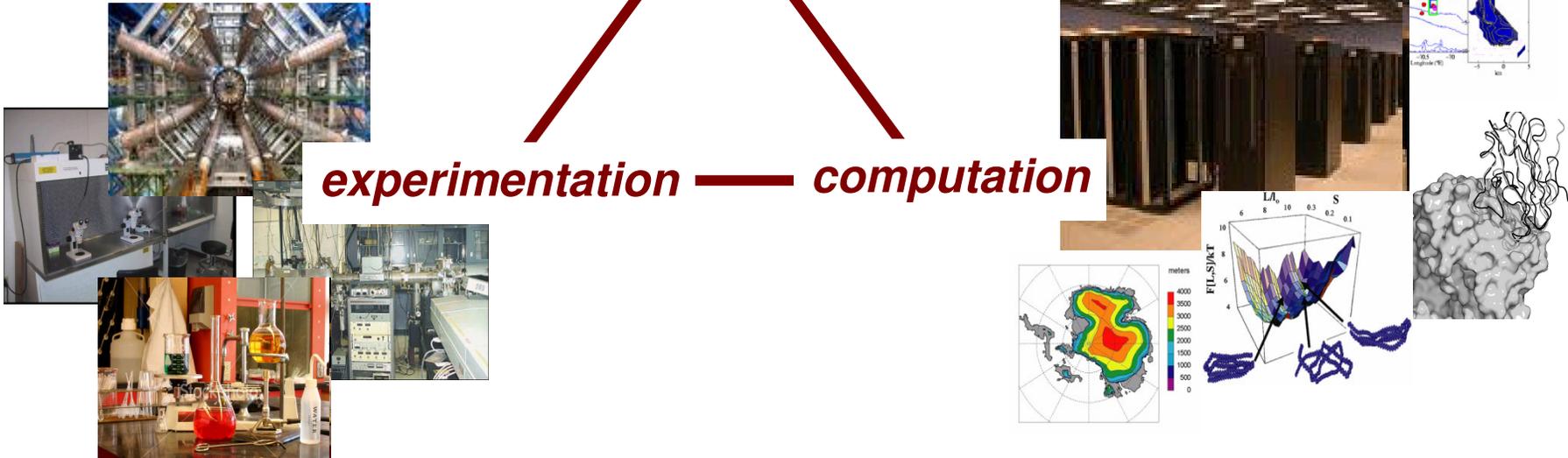
What is HPC?

- using large clusters of computers, or special-purpose “supercomputers,” in computing applications that are too large or would take too long for “traditional” computing
- “third leg” of science, engineering inquiry

$$E = mc^2$$

theory

experimentation — *computation*



Massachusetts Green HPCC Project History

- ❑ **2007-08:** MIT detailed state-wide study for MA HPC facility
- ❑ **Oct 2008:** Governor; MIT, UMass presidents; EMC, Cisco, Accenture CEOs meet regarding collaboration to strengthen IT sector in MA
- ❑ **Jan 2009:** President Hockfield (MIT) approaches President Wilson (UMass) about potential university consortium for HPCC collaboration
- ❑ **Feb-May 2009:** Conversation extends to Governor and state agencies, other universities, and industry
- ❑ **June 11, 2009:** LOI signing: Governor; MIT, UMass, BU presidents; Cisco, EMC, Accenture CEOs commit to 120-day planning process
- ❑ **Oct 21, 2009:** Governor outlines progress at event in Holyoke and sets Fall 2010 groundbreaking goal
- ❑ **Jan 2010:** Northeastern joins university consortium
- ❑ **Mar 29, 2010:** Governor's announces \$25M state commitment to Green HPCC and announces certification of Holyoke Growth District

Progress Since June 2009

- ❑ Established university consortium and built shared vision for green HPCC
- ❑ Developed basic organizational and programmatic model for operations, research, education and partnerships
- ❑ Identified site and facility requirements and narrowed down potential sites to final two (selection in summer 2010)
- ❑ Developed and refined estimates for capital and operating costs
- ❑ Developed the RFP for engineering and design
- ❑ Outlined the focus of R&D and education programs related to high performance computing
- ❑ Secured \$40 M in capital commitments from university partners and \$25 M state commitment (plus projected \$65 M of university equipment to be located at the GHPCC)



University Consortium Activities through Summer 2010

- ❑ Establish legal entity to manage GHPCC facility and start recruitment for executive director (April-May)
- ❑ Select engineering and design team (March-May)
- ❑ Initiate R&D/education program (begin in April)
 - Education Workshop (April 15 at Holyoke Community College)
 - R&D Collaboration workshops (summer)
- ❑ Finalize IT architecture and services plan (summer)
- ❑ Select a final site (summer)
- ❑ Participate in work of Innovation District Task Force to help Holyoke capitalize on economic development opportunities made possible by GHPCC (ongoing)

Workshop on Educational Opportunities Associated with a Green HPC Facility

April 15, 2010 – Kitteredge Center, Holyoke Community College

http://www-net.cs.umass.edu/ghpcc_workshop_april_2010/

Sponsored by the Commonwealth Information Technology Initiative

Program

08:30-09:00	Continental Breakfast
09:00-09:15	Welcome
09:15-10:15	Keynote Address – Dr. Francine Berman, Vice President for Research and Professor of Computer Science at Rensselaer Polytechnic Institute
10:15-10:45	Refreshment
10:45-12:00	Panel – Chair: Dr. Rick Adrion, Professor of Computer Science, UMass Amherst
12:00-12:30	Breakout session planning, and assignment of breakouts – Chair: Dr. Azer Bestavros, professor of Computer Science, Boston University
12:30-13:30	Lunch
13:30-15:00	Breakouts
15:00-15:15	Refreshment
15:15-16:00	Breakout Report-back & Wrap up

GHPCC as a Catalyst for Economic Development

- ❑ Academic research facilities such as the GHPCC are by themselves not a solution for creating for regional economic growth
- ❑ Key role is as part of larger strategy for economic development in the city and region, especially the Innovation District
 - Green HPCC can serve as an “anchor” for the Innovation District
 - Green HPCC can serve as a catalyst and “proof point” to private industry that Holyoke is a place where they can develop energy-intensive IT facilities
 - Demonstrates value of city’s affordable clean energy, strong IT connectivity, and developing IT workforce
- ❑ Commitment by 4 leading research universities puts Holyoke “on the radar screen” for IT companies and others
- ❑ Universities prepared to partner with Task Force and other government, business and industry leaders to create a favorable environment for growth in the region

Possible Economic Development Opportunities for Holyoke Innovation District

- ❑ Cisco Smart + Connected Community designation – how can this be capitalized on and leveraged for added impact?
- ❑ EMC exploration of Holyoke as potential data center site – how can Holyoke generate interest from other IT companies and market itself effectively?
- ❑ Expanding links with existing local companies – how can Holyoke identify firms who would benefit from the GHPCC and serve their needs?
- ❑ Attraction of suppliers and service providers – how can the GHPCC be used to bring in new firms? What are experiences of other regions?
- ❑ Development of spin-off companies – can they be housed near GHPCC? Have special relationships? What about an incubator?
- ❑ Other?