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Integration of **SMART BUILDINGS** Technology in GSA PBS

CFMH Industry Day
March 24, 2010

What is the GSA Smart Building Program?

- The Smart Buildings program is the *technology and systems* aspect of “GSA High Performance Green Buildings”
- The Smart Buildings program directly supports ARRA performance standards including *advanced lighting controls and smart meters*
- The Smart Buildings program is *aligning multiple High Performance Green Building efforts* including construction standards, energy, operations, regional operations, and more

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A “Smart Building” **integrates** major **open** building systems on a common network

Building systems **share** information and functionality to improve

- energy efficiency,
- operational effectiveness, and
- occupant satisfaction

“Smart Buildings” characteristics

1. Real-time **visibility** into integrated performance
2. Granular **control** over energy consuming systems
3. Evolved **policy** to increase performance including
 - Energy efficiency and sustainability
 - Operational effectiveness
 - Occupant experience
- Foster Administrator’s priorities: **innovation; operational excellence; customer intimacy**

Smart Building Technology Standards

1. Open

- Non-proprietary building controls that give GSA greater flexibility to manage systems and reduce service costs

2. Converged

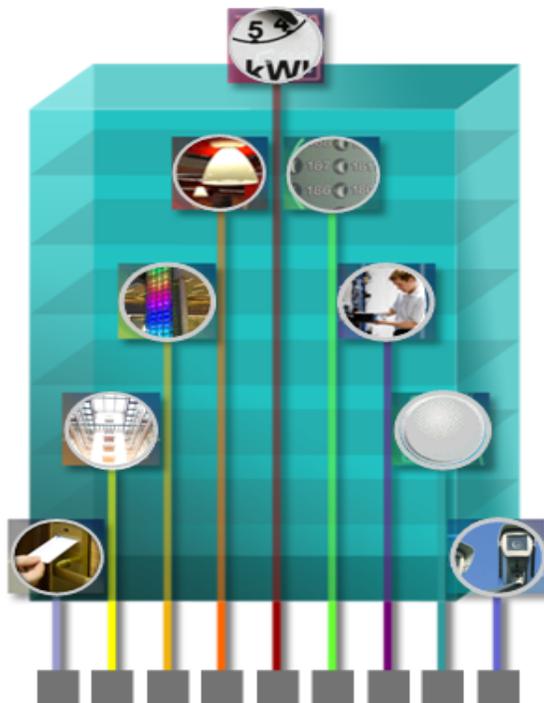
- Common sense elimination of overlapping controls infrastructure such as conduit and cabling and networking for

3. Normalized

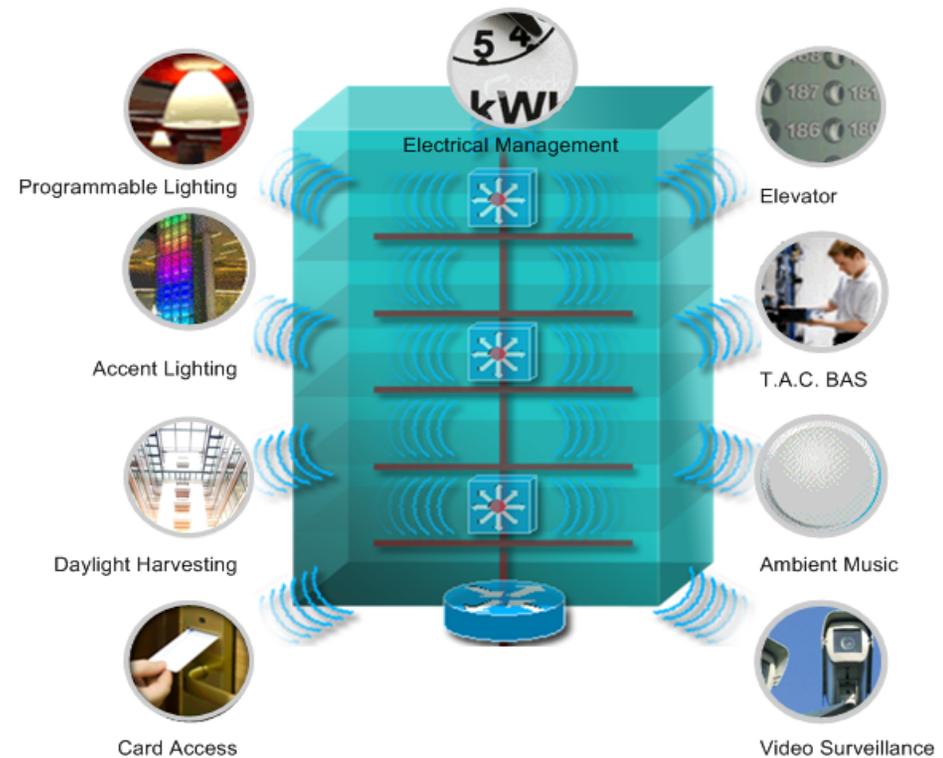
- Different controls manufactures or even disparate systems can “talk” to each other allowing for more flexibility and management control

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Legacy Buildings



Connected Buildings



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Why do this?



- EAct 2005: 30% more efficient than ASHRAE 90.1
- EO 13423: Energy Use 30% below 2003 baseline by 2015
- EISA 2007: Zero fossil fuel use by 2030; 65% cut by 2015; 80% cut by 2020
- EO 13514: Green House Gas Reductions by 2020

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Strategies

Benefits

Enterprise Management

Enterprise

Enhanced Operational Effectiveness

Systems Integration

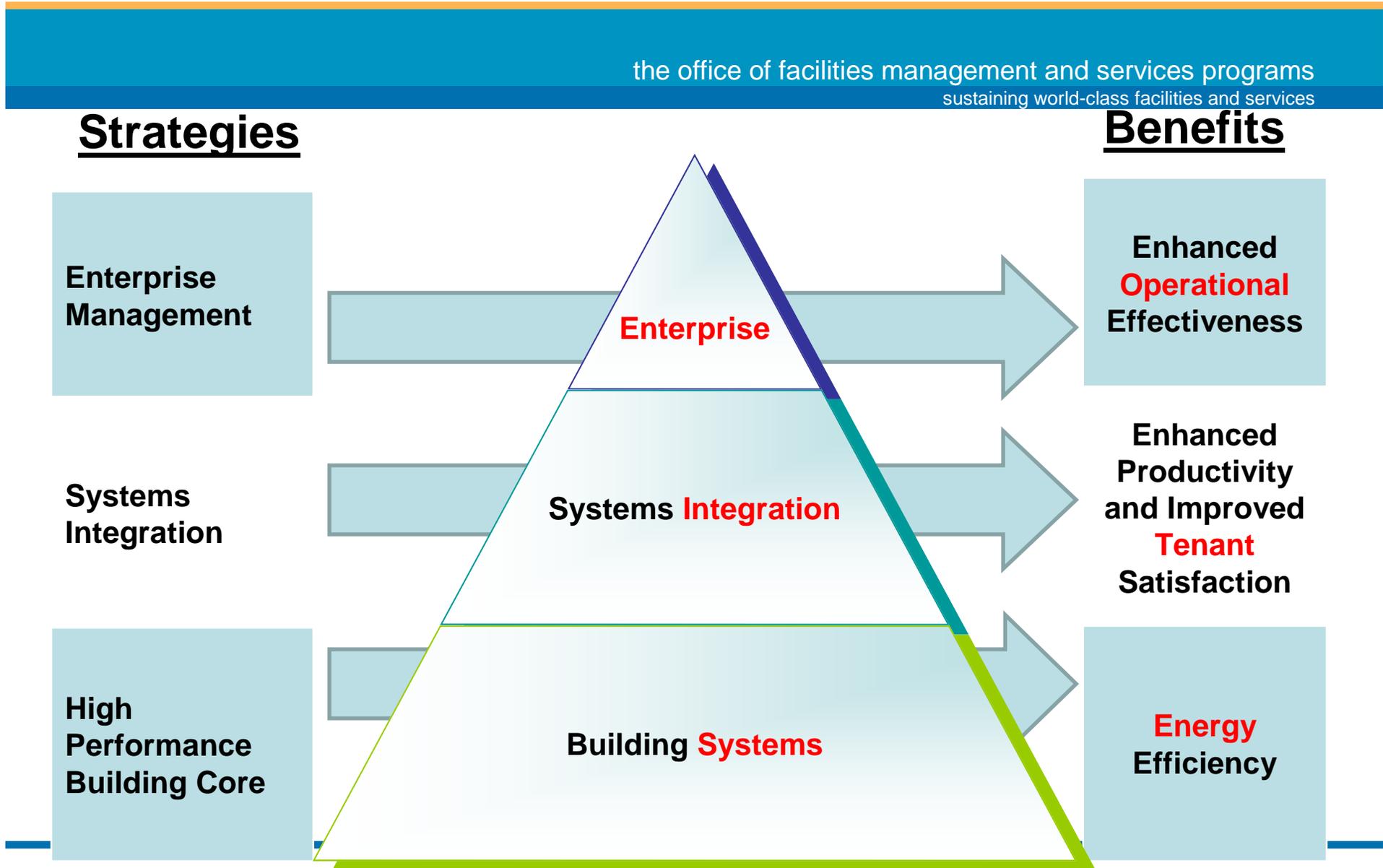
Systems Integration

Enhanced Productivity and Improved Tenant Satisfaction

High Performance Building Core

Building Systems

Energy Efficiency



Smart Building Strategy Statement

- GSA will be a green proving ground for the real estate industry in three key areas:
 1. Buildings: Progressive *and* experimental use of systems and methods (PV, DCMG Green Roof, lighting)
 2. Technology: Capture and analyze data for continuous optimization and results measurement
 3. People: Transform staff with skill sets for next generation building information management
- In doing this GSA will “make the market” with requirements for product and service innovation

Smart Building Action Plan

1. Practice “80/20” approach to portfolio for energy and emissions we can affect
2. Set standards for ARRA now
3. Measure performance of green proving ground and manage (CGO) towards EO
4. Transform people

Smart Building Action Plan Item 1

1. Practice “80/20” approach to portfolio for energy and emissions we can affect
 - a. Synchronize Smart Building efforts with smart meter efforts on 50-100 buildings
 - b. Smart Buildings can “control” what smart meters can “see” inside the building
 - c. Smart Building link to smart grid outside the buildings – Demand response, time based pricing, predictive load and price
 - d. Target 200 hundred buildings to affect 75% of energy and emissions

Smart Building Action Plan Item 2

2. Set standards for **ARRA now**

- a. ARRA focus list of 30 projects
- b. Focus list comprises 25% of ARRA construction spending (\$1.5B)
- c. Greater visibility into and control of systems
- d. Ready for connectivity and monitoring

Smart Building Action Plan Item 3

3. Measure performance of green proving ground and manage (CGO) towards EO

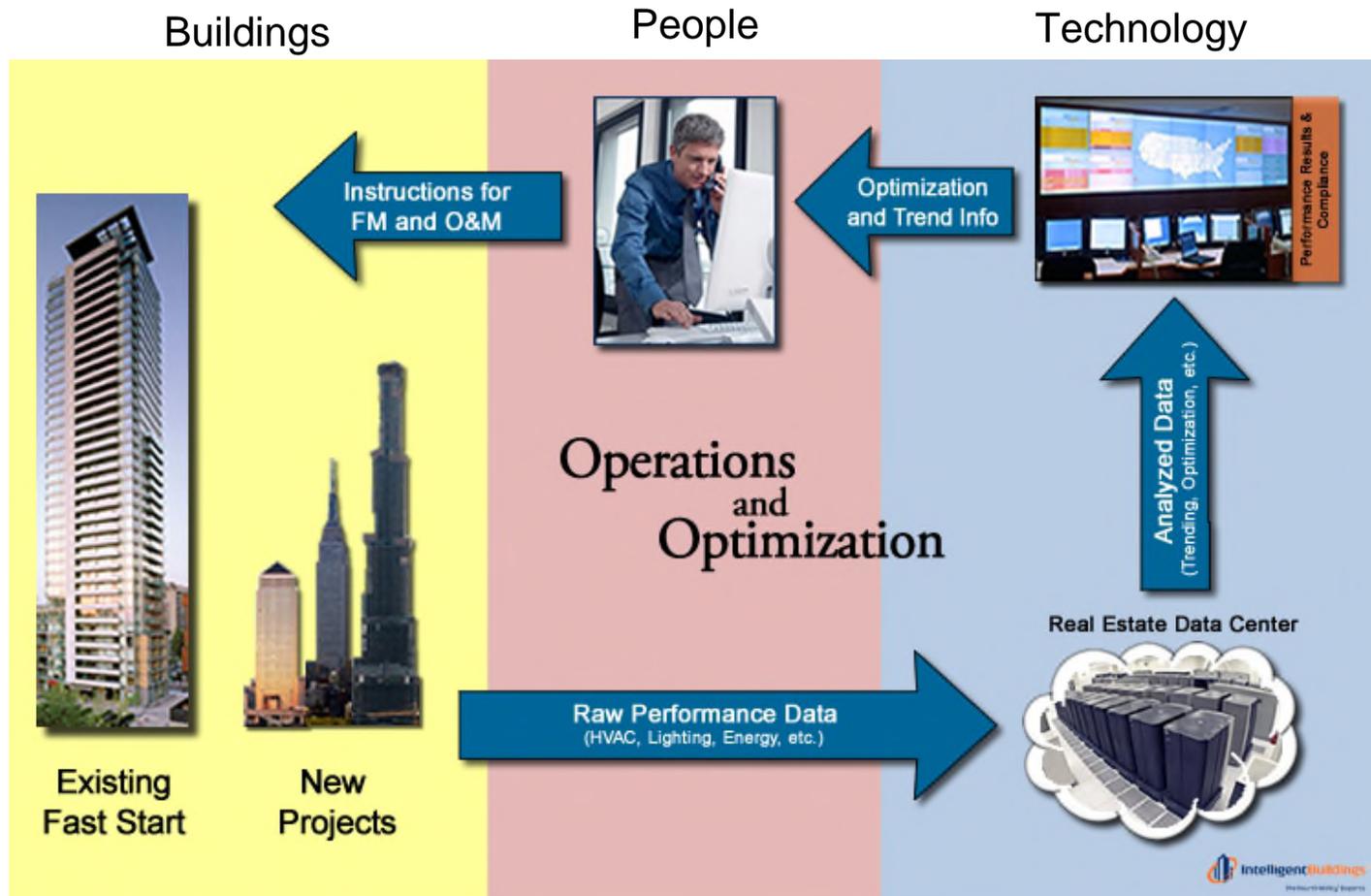
- a. Sustainability Support Center (SSC)
- b. Align Energy, Operations and IT
- c. Categorize experimental systems for evaluation
- d. Track and manage energy and emissions

Smart Building Action Plan Item 4

4. Transform people

- a. Substantially develop new information dashboards, management practices and behavior incentives
- b. Turn data into information
- c. Turn information into Action
- d. Turn Action into Results

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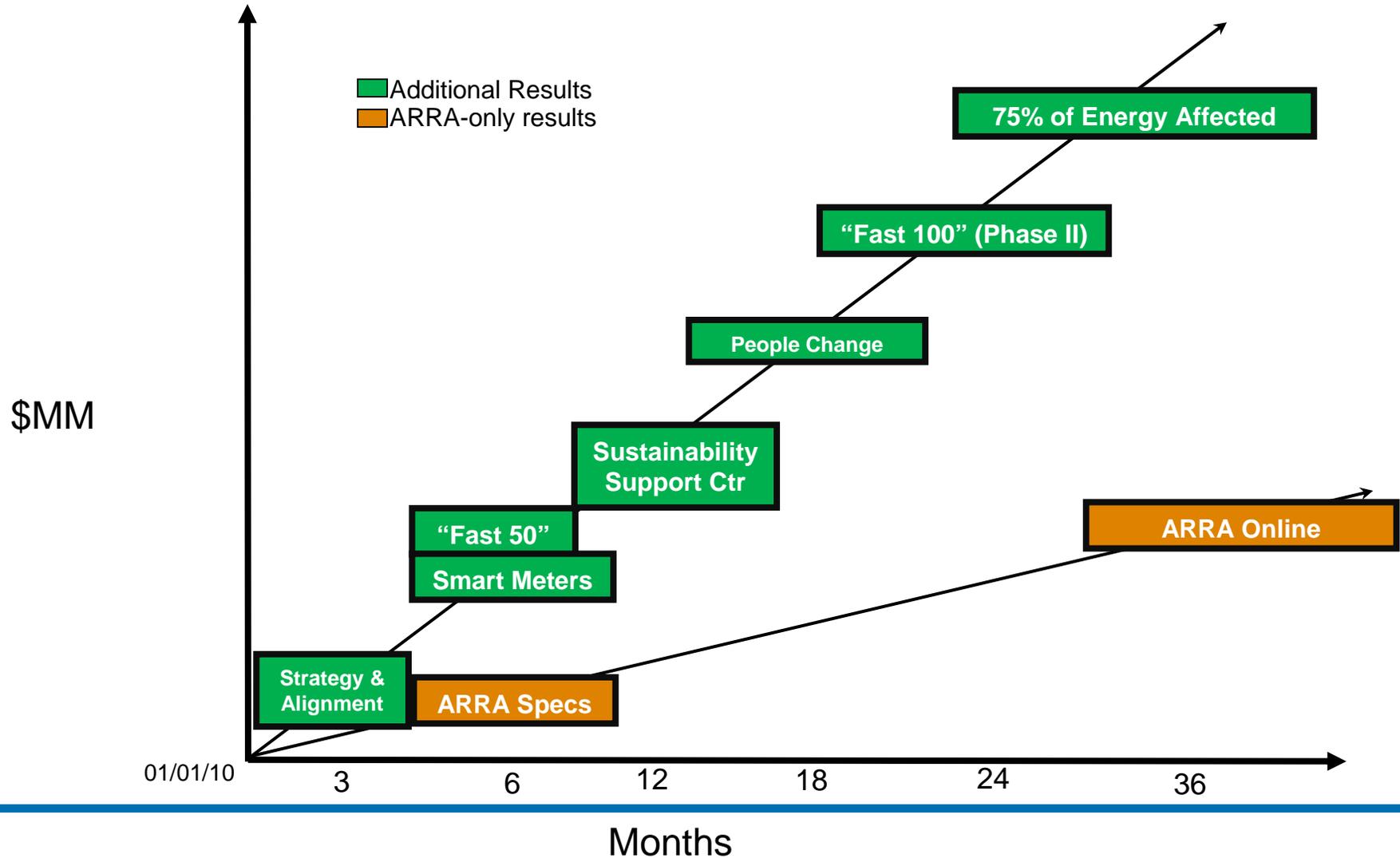




Milestones and Timeline

Public Buildings Service

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Projects

- Phase 1: 30 ARRA Green Building Modernizations (not operational as Smart Buildings for 2-3 years)
 - Phase 2: 50 existing buildings identified by 4/15/10
 - In 3-5 years, identify 200 buildings that cover 75% of energy use
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Next Steps

- Implement Smart Building technology in projects
- Plan Sustainability Support Center
 - Sophisticated Trending and Analysis
 - Additional Tool and Information for Regions
 - Closely Coordinated with Energy Operations and Other Stakeholders
- Mock Up Space/Living Lab for Policy Development Planning

What Does Success Look Like?

- Attain/Exceed ROI Financial Analysis Identified In Business Case
- Buildings Adapt to Customer Needs
- Customers Adapt to Energy Goals through New Work Place Experiences & Behaviors
- Buildings Become More Energy Efficient Through Visibility of Building Systems
- Smart Buildings Technology Contributes to Energy & Green House Gas Reduction Goals
- Model for Commercial Real Estate Industry

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QUESTIONS?

