

A low-angle, upward-looking photograph of several modern skyscrapers with glass facades, creating a sense of height and architectural scale. The buildings are set against a clear blue sky.

Mid-Atlantic Education: Next Frontiers in Sustainable Building Construction and Operation

CoreNet Global
Mid-Atlantic Chapter
April 9, 2014

Next Frontiers in Sustainable Building Construction and Operation

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GSAlink - Driving Value With Smarter Building Analytics

April 9th, 2014

Frank Santella
Acting Assistant Commissioner
GSA, PBS, Facilities Management
& Services Programs

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1. Target

- 200 most energy intensive “covered” facilities targeted which consist of over 100 million square feet

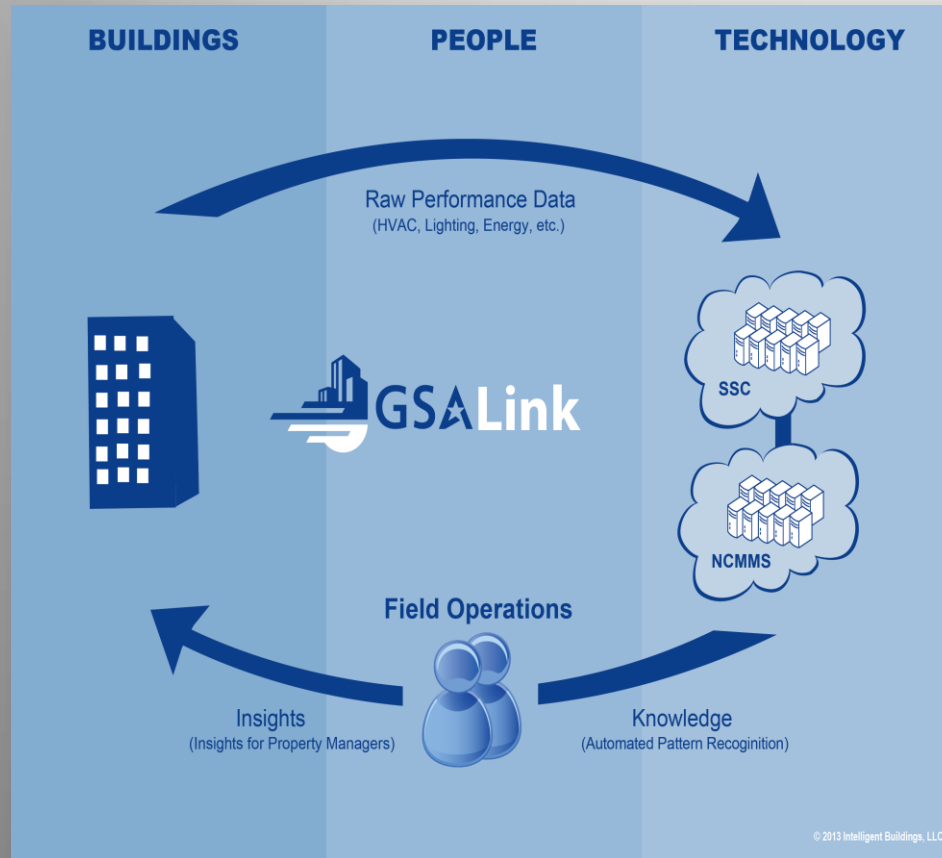
2. Currently Live

- 55 buildings representing 32 million square feet connected now
- 15,000,000 data points per day gathered
- To date over 5,000,000,000 points analyzed

3. Later this year

- Adding 26 building and 15 million additional square feet

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GSALink was developed as a regional support platform:

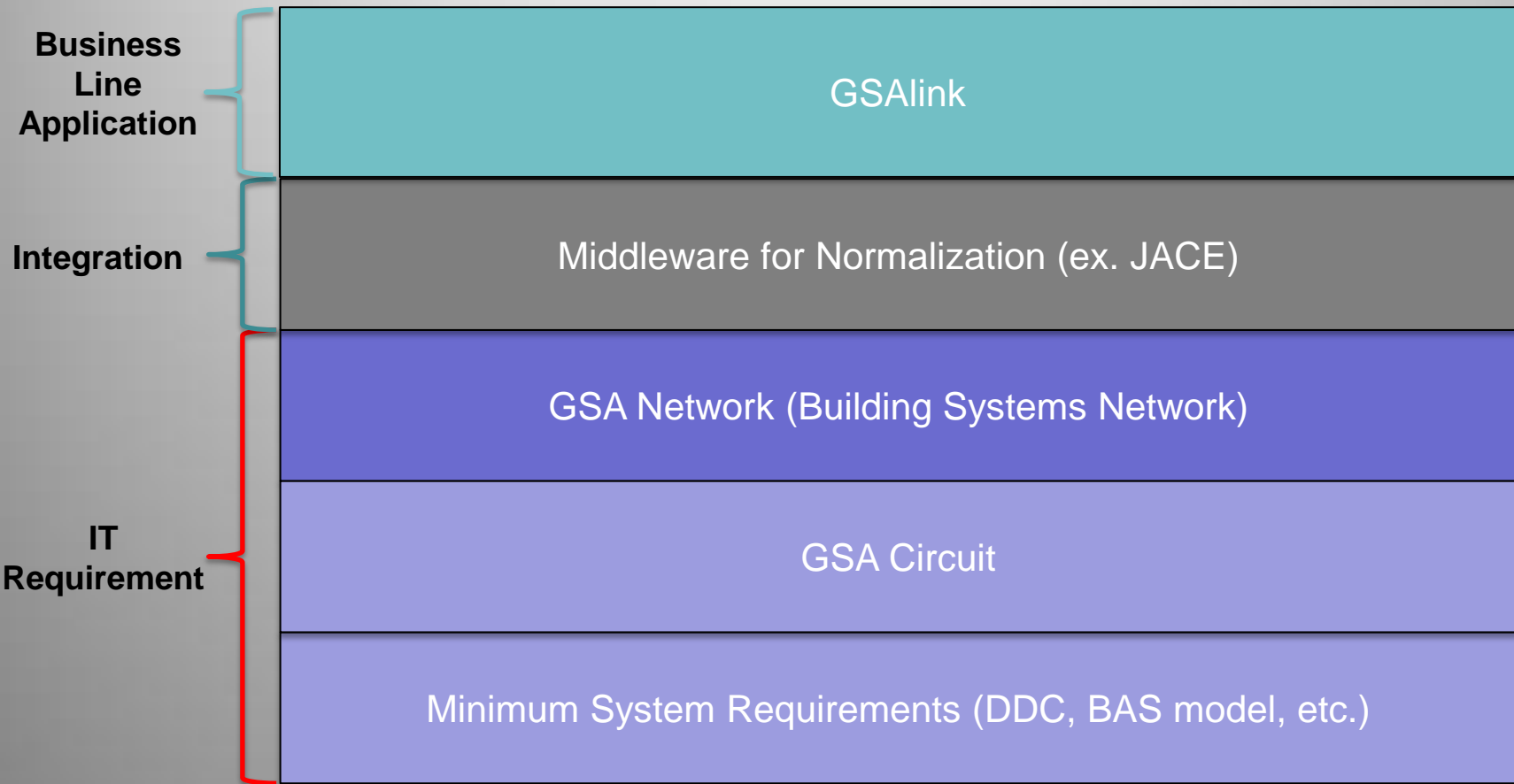
- Common architecture to stem the growing number of disparate data analytics platforms.
- Vendor independent approach that would allow for interchangeable parts
- Long-term dependence for operations and energy in region



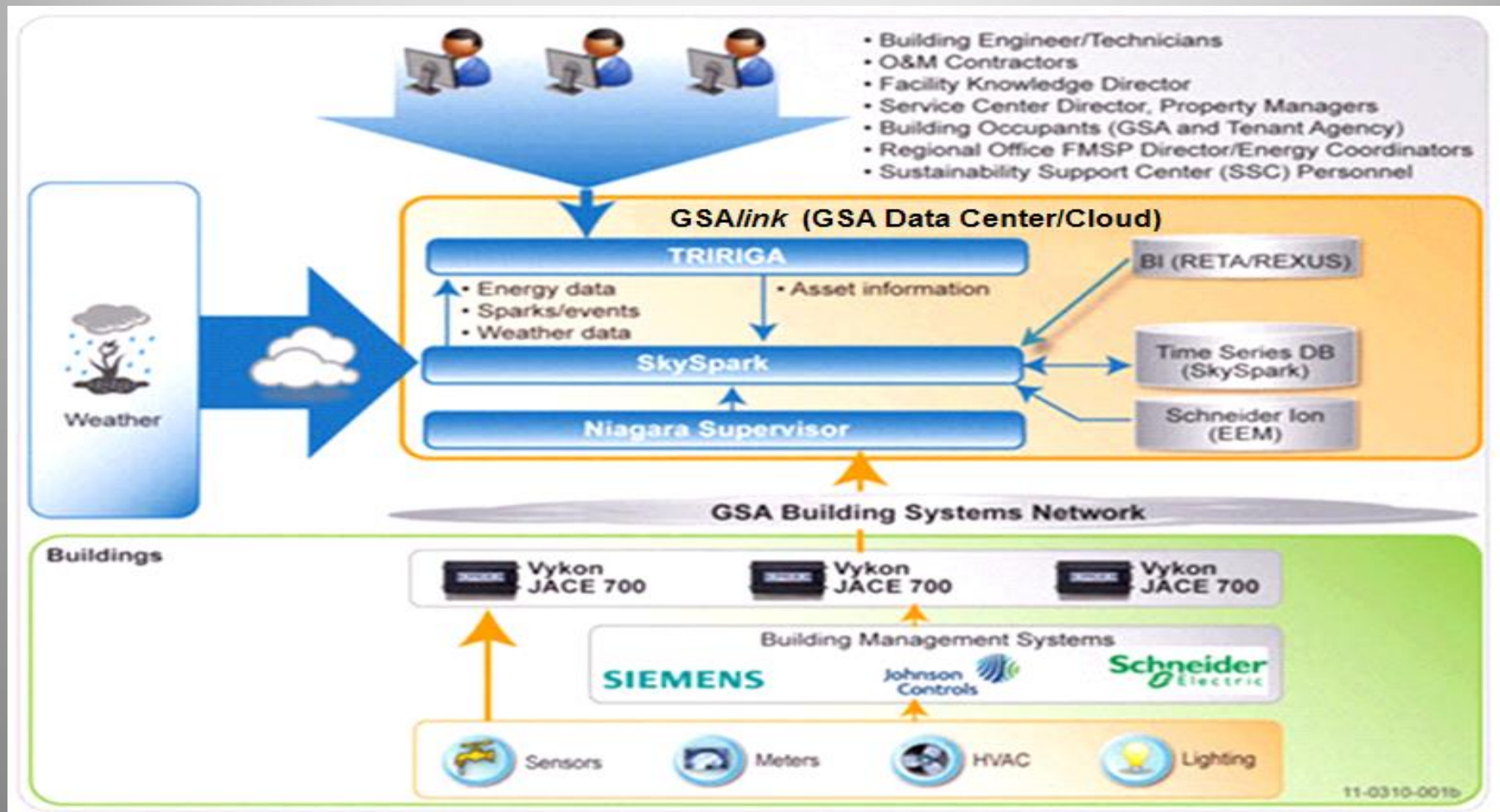
GSAlink “Building Blocks”

Public Buildings Service

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GSA GSAlink - Innovating Smarter Buildings

Home

My Reports

Portfolio

Spark Login

Home

Open In New Window

My Bookmarks

Total Estimated Cost Impact (\$)



Top 10 HGRID Reports



Spark Top Ten HGRID

Spark Top Ten Drill Down



Equipment Top 10 HGRID

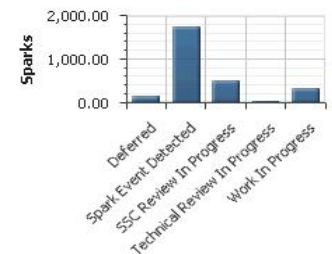
Equipment Top 10 Drill Down

Last Visited

GSA Locations



Spark Resolution Graph



Spark Status

Reminders

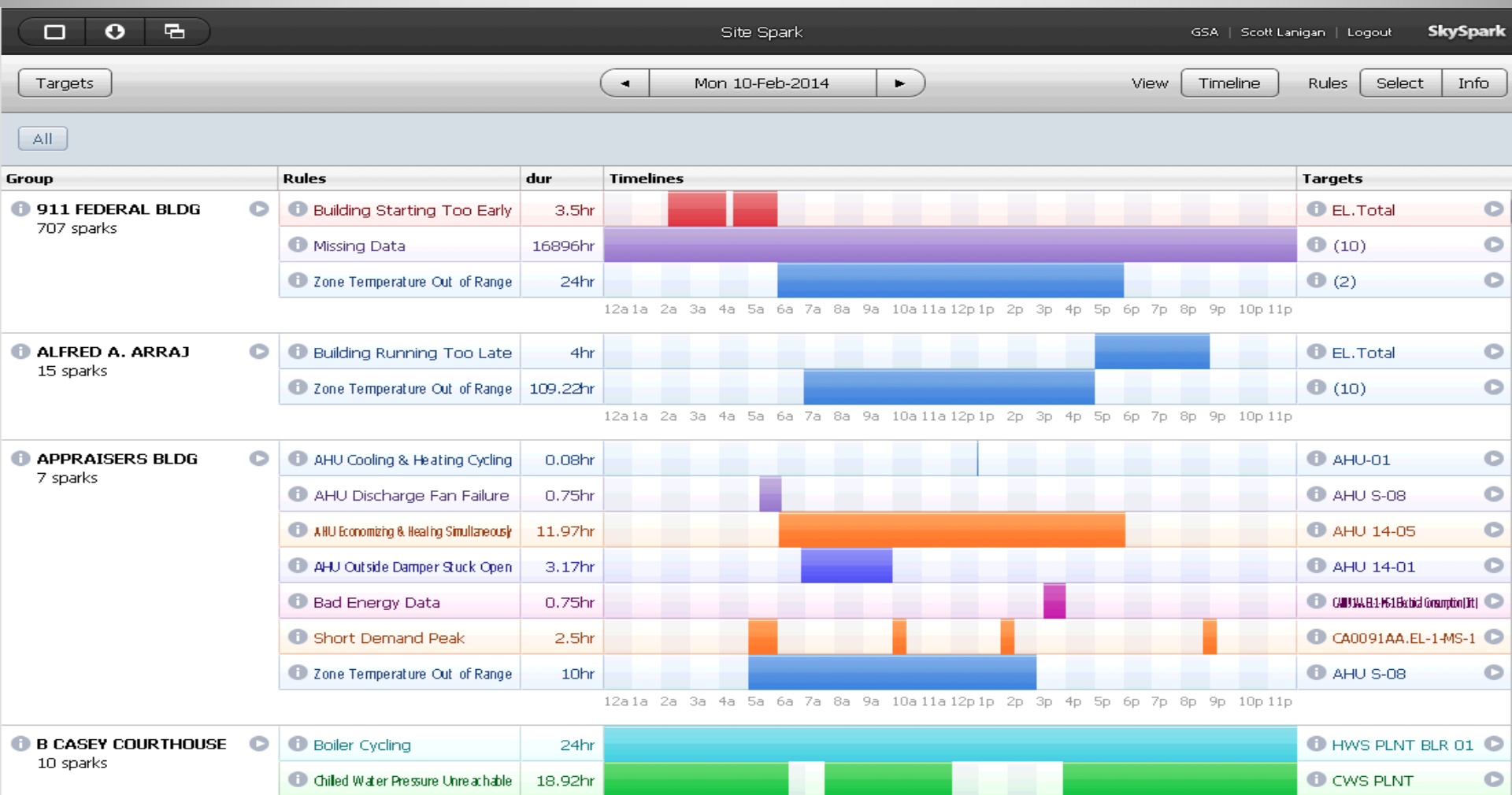
Notices

0 Action Items

5 Notifications

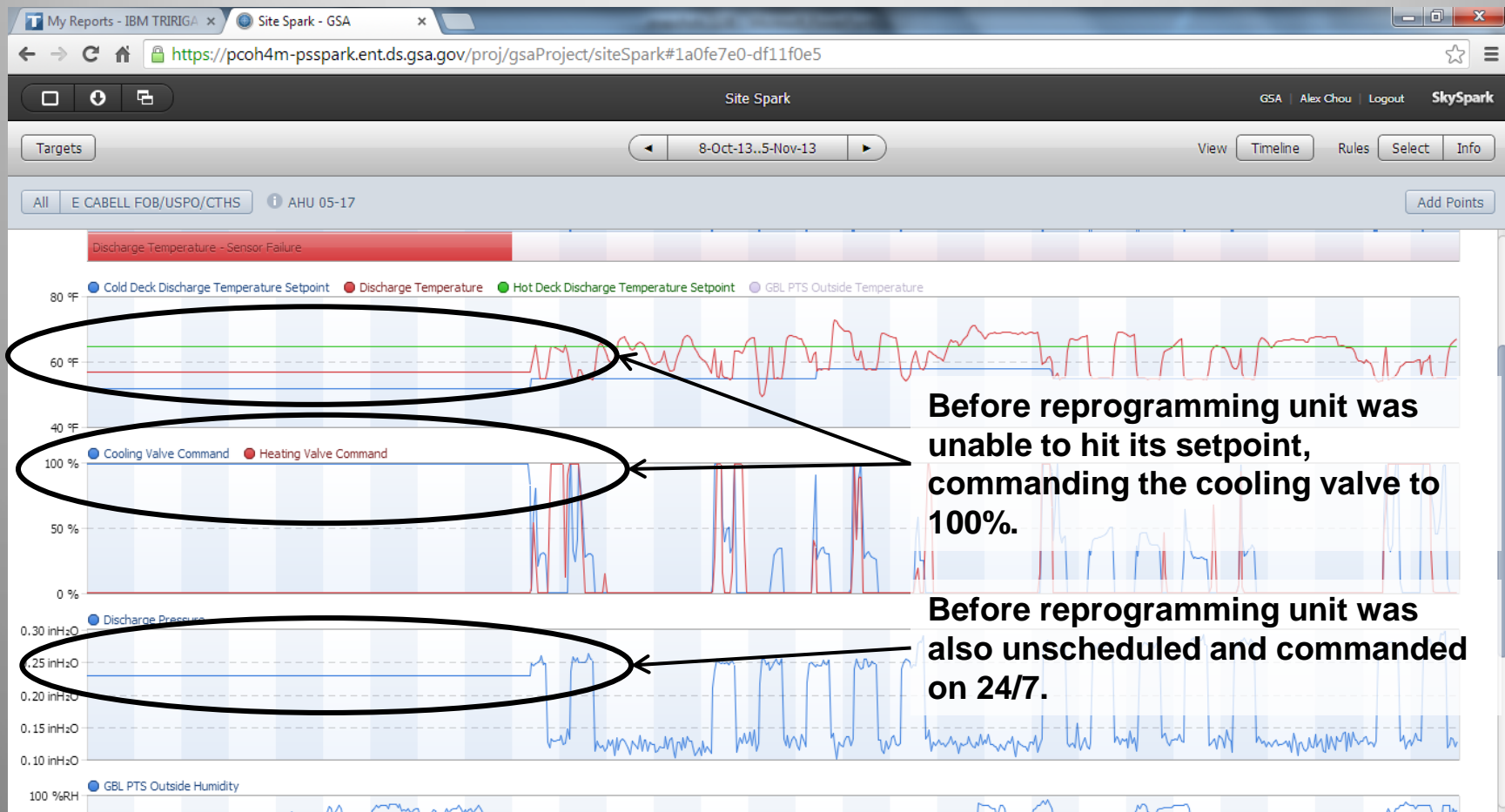
Related Links - Spark Management

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Sensor Failure



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“GSA Link has moved us light years ahead into an entirely new and improved understanding of our buildings and provided a means for recognizing, analyzing and overcoming building system issues that has never existed before.”

GSA Service Center Director

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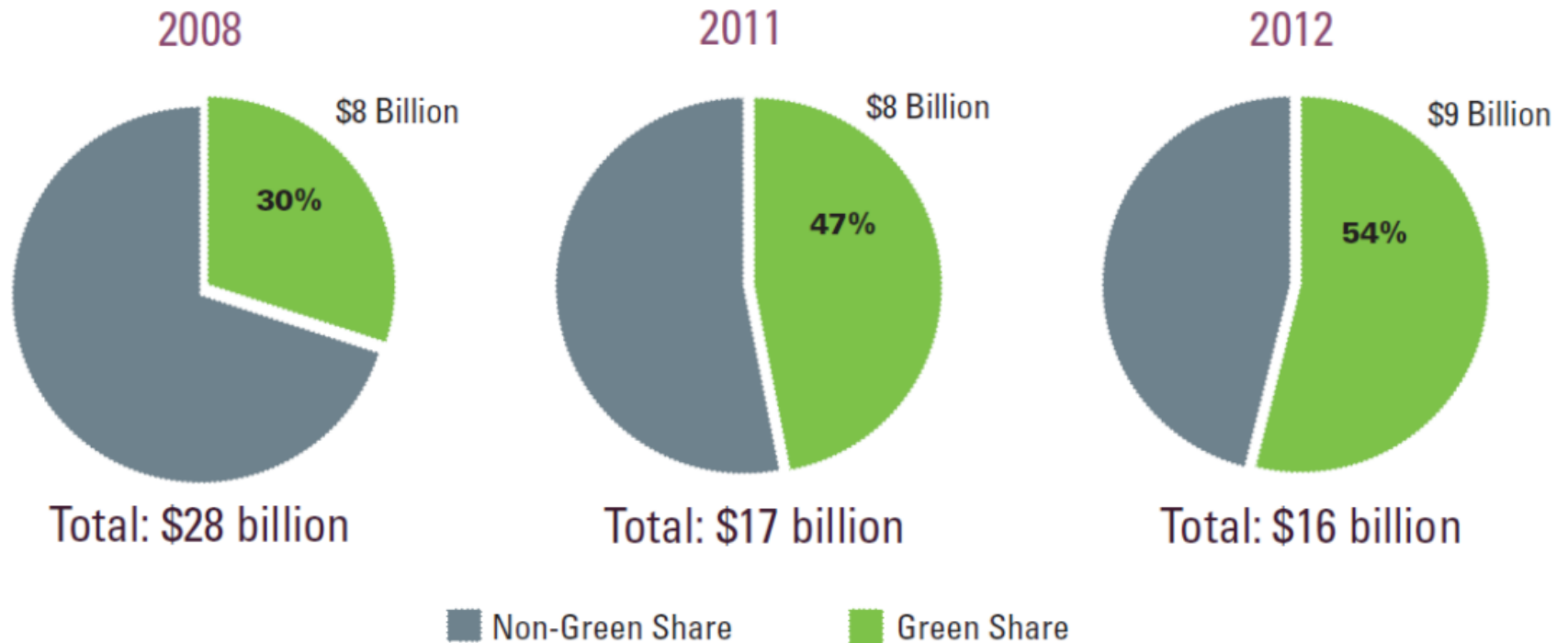
GSAlink and the GSA Smart Buildings Program has developed infrastructure and personnel support for regions including:

1. [IT](#): Developed building systems network and standards for compliant connectivity for buildings in region.
2. [People Alignment](#): FMSP and PBS ITS alignment for support
3. [Centralize Knowledge](#): Sustainability Support Center resources for interpretation and counsel on fault data.



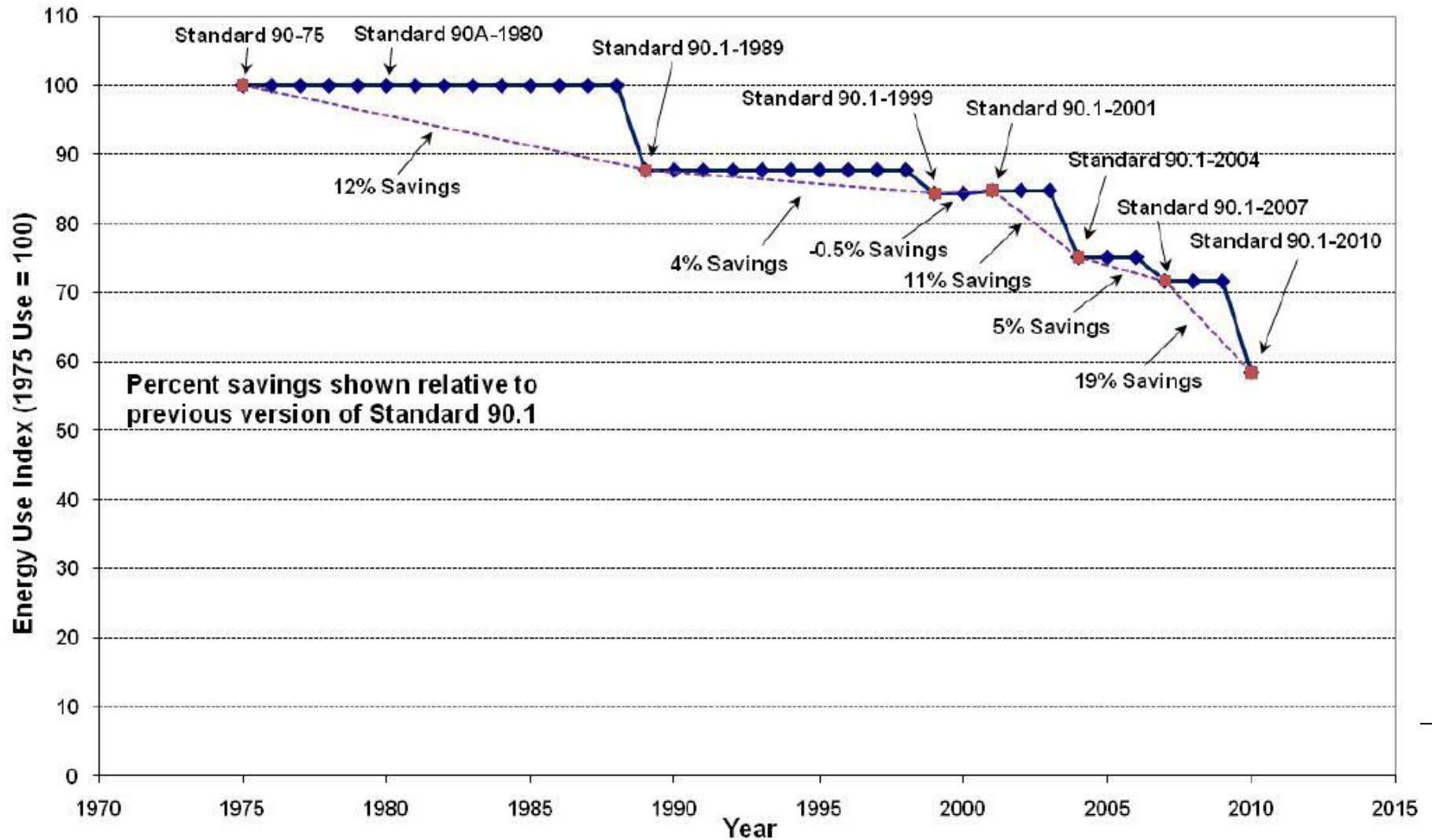
LEED v4
BETTER
BUILDINGS
ARE OUR
LEGACY

COMMERCIAL OFFICE MARKET SHARE



Source: McGraw-Hill Construction's 2013 Dodge Construction Green Outlook

ENERGY CODE PROGRESS









LEED v4: **FOCUS ON PERFORMANCE**

GLOBAL ADAPTATIONS



LEED v4:
ONE GLOBAL LEED

MARKET SECTOR ADAPTATIONS

-  Data Centers
-  Warehouses and Distribution Centers
-  Hospitality
-  Existing Buildings for Schools
-  Existing Buildings for Retail
-  Homes Multifamily Midrise

SIMPLIFIED: THE STRUCTURE OF EB

ESTABLISHMENT

static and foundational

ASSETS

meters, lighting, landscaping

POLICIES

site management, purchasing

PERFORMANCE

dynamic and recurring

ACTIONS

surveys, audits, testing

TRACKING

energy, purchasing, waste

LEED v4 SYSTEM GOALS



Reduce contribution to **global climate change**



Enhance individual **human health**



Protect and restore **water resources**



Protect and enhance **biodiversity and ecosystem services**



Promote **sustainable and regenerative** material cycles

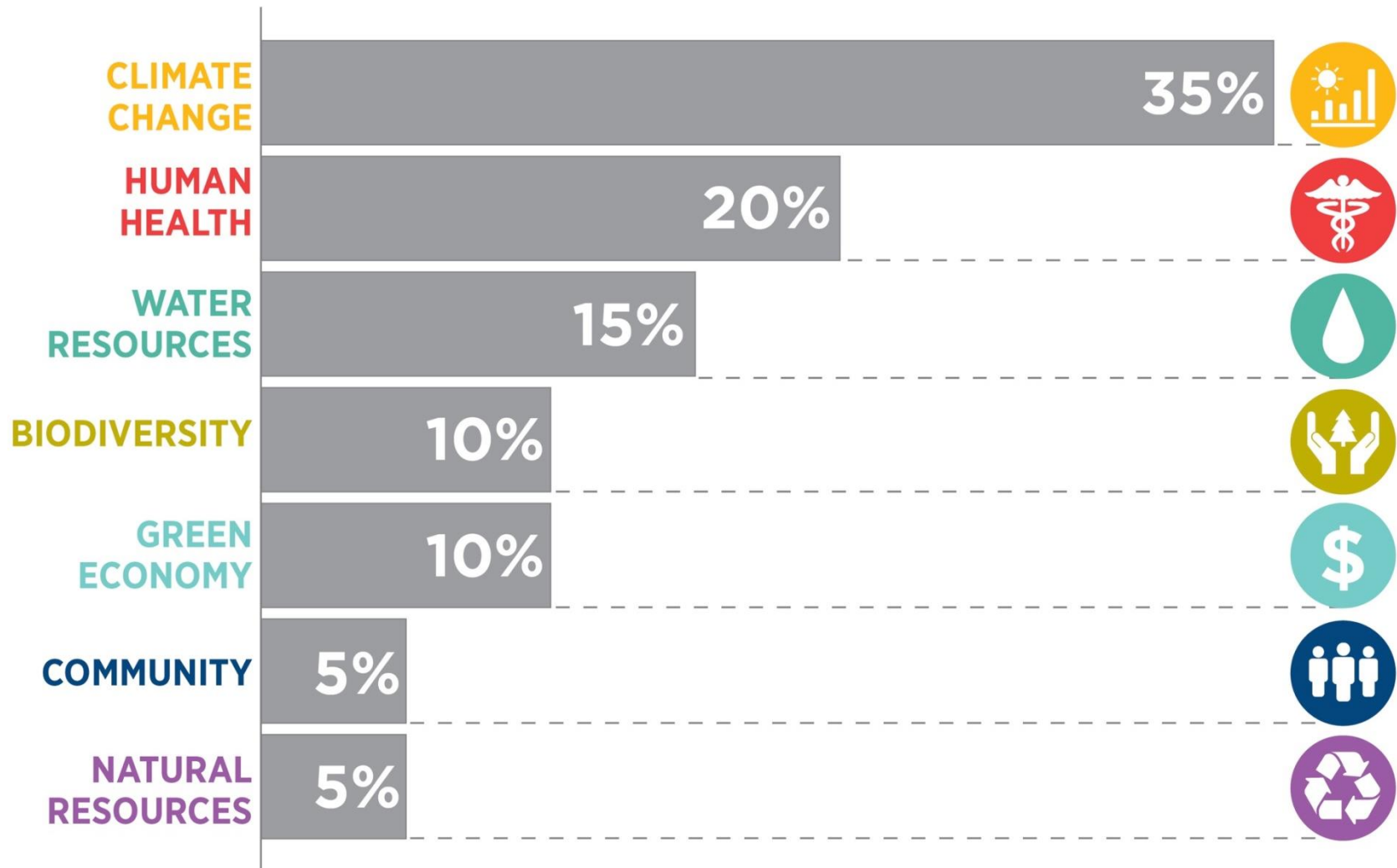


Build a **green economy**



Enhance **community quality of life**

LEED v4 SYSTEM GOALS





LOCATION & TRANSPORTATION



SUSTAINABLE SITES



WATER EFFICIENCY



ENERGY AND ATMOSPHERE



MATERIALS AND RESOURCES



LEED v4 TECHNICAL IMPROVEMENTS: MATERIALS & RESOURCES

Life cycle thinking approach to category.

Optional **whole building life cycle assessment** for new construction.

Focus on product **transparency** and **outcomes** through Building Disclosure & Optimization credits.





INDOOR ENVIRONMENTAL QUALITY

LEED v4: IMPROVED USER EXPERIENCE

REFERENCE GUIDE



LEED DOCUMENTATION

Fewer Forms. Reduced forms by 80% compared to LEED 2009 to improve system performance and consistency.

Alignment across rating systems

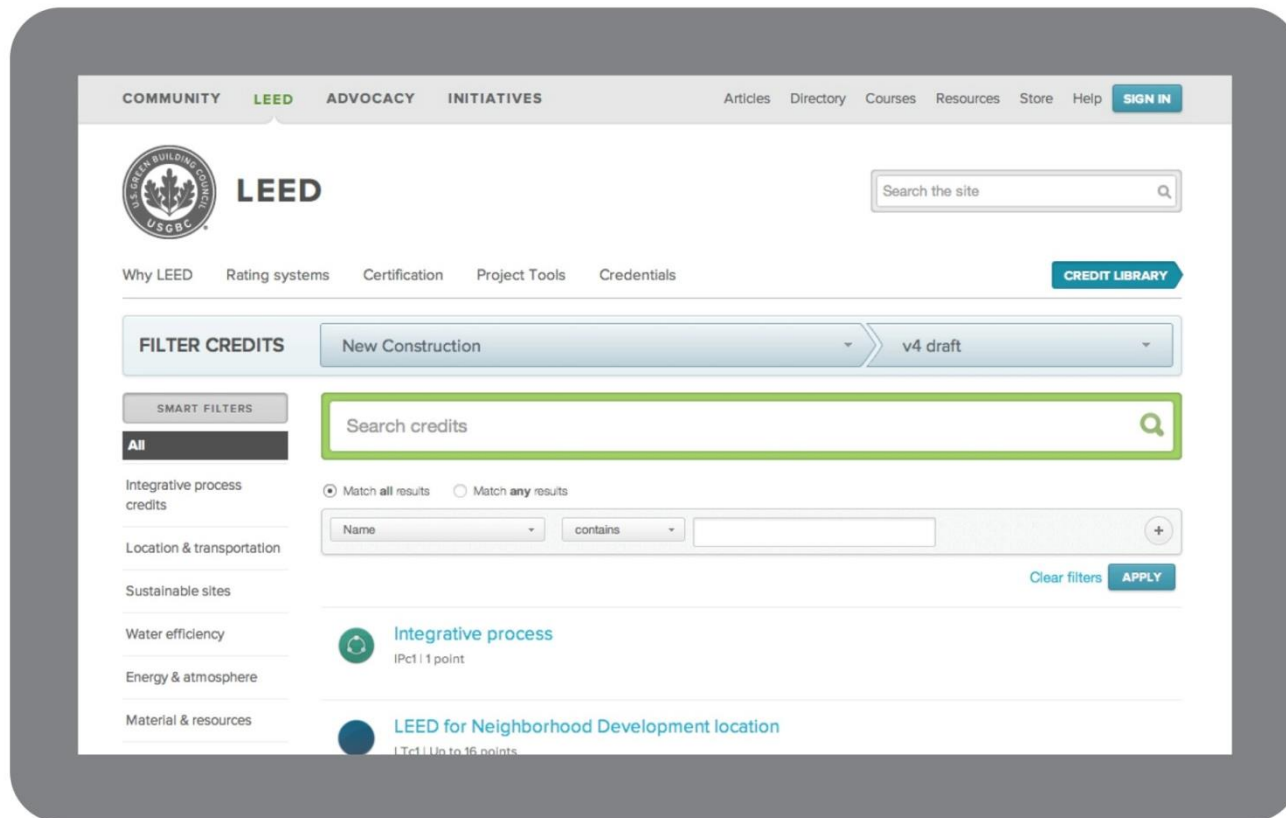
Includes campus, multiple building, recertification

Fewer fields to document. Removed low-value documentation requirements.

Removed required signatories

Removed duplication of content

LEED CREDIT LIBRARY



LEED v4: **WHERE ARE WE NOW?**

LEED v4: CURRENT STATUS

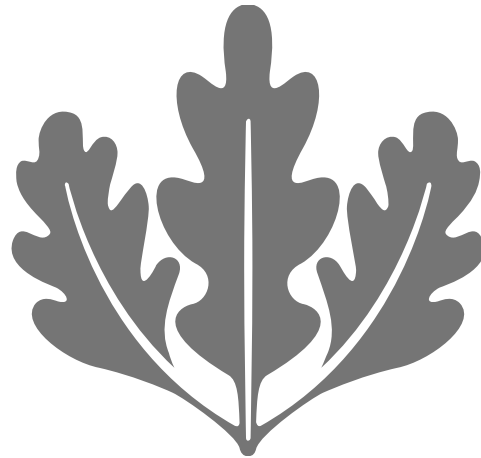
Held six public comment periods and received over **22,000 comments**

Passed ballot in **June 2013** with 86% approval

Extended registration for LEED 2009 until June 2015

Engaged over 100 project teams in LEED v4 **beta** test

Program launched at Greenbuild in **November 2013**



New Frontiers in Sustainable Building



Center for Strategic and International Studies

- ✓ LEED Platinum Certification
- ✓ Rainwater collection
- ✓ HVAC condensate supplements water feature
- ✓ Green Roof



Washington Gas Headquarters

- ✓ First east coast installation
- ✓ No emissions; water vapor only
- ✓ Water used to cool the cells
- ✓ No precious metals in the production
- ✓ Provides 60% of power

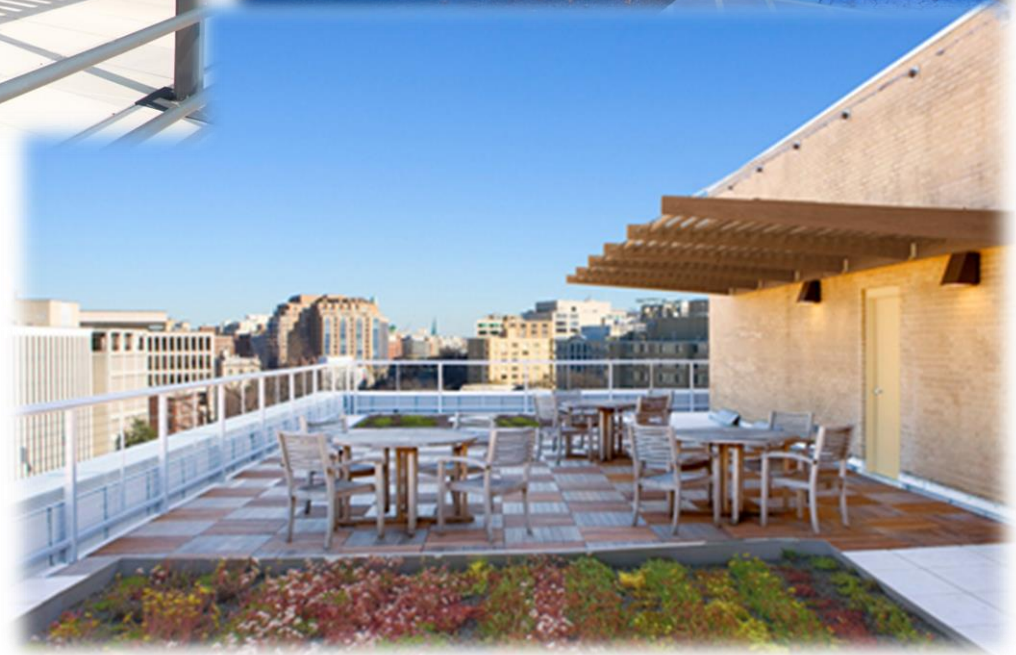


Portfolio Approaches

- ✓ Leverage energy spend across buildings
- ✓ Tenant retention
- ✓ Occupancy comfort
- ✓ Energy conservation strategy is still a good business investment
- ✓ Enhance building value



How we get HITT done



New Technologies and Tools

- ✓ Beyond green building rating systems
- ✓ Visualization of construction alternates
- ✓ Repositioning strategy development
- ✓ Building monitoring
- ✓ Streamlining and efficiency
- ✓ Respond to regulation requirements
- ✓ Existing building diagnostics



Virtual Construction

- ✓ Eliminate process waste
- ✓ RFI generation translates into savings
- ✓ Increased productivity
- ✓ Conserves natural resources



Building Performance Integration

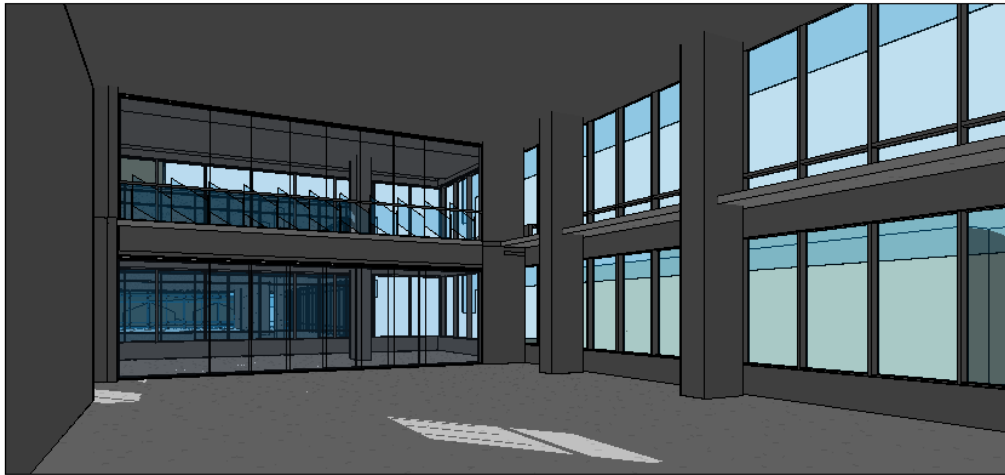
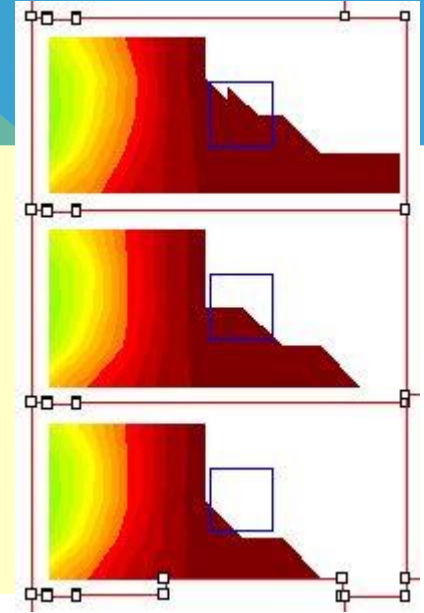
- ✓ Proves regulation compliance
- ✓ 60% of green building credits are complete
- ✓ Program science backed
- ✓ Leverages Revit model
- ✓ Populates templates automatically
- ✓ Building diagnostics to guide remediation



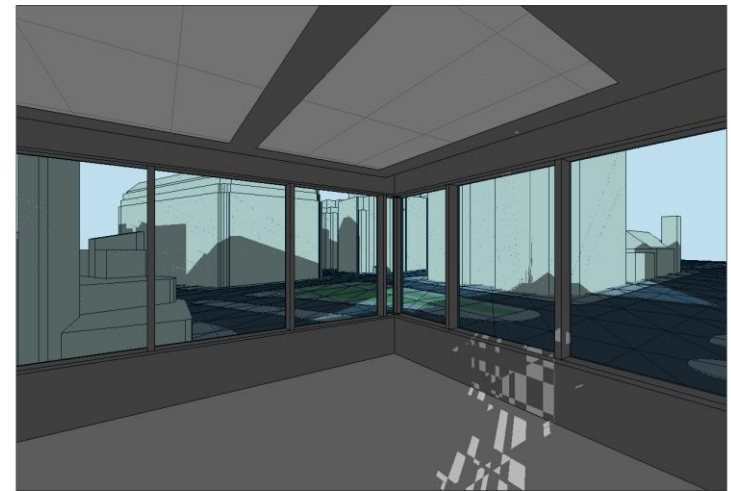
Lighting Enhancements



- ✓ Impact of surrounding on lighting strategy
- ✓ Natural light penetration
- ✓ Daylighting technology location
- ✓ Artificial lighting comparisons
- ✓ Optimize impact while minimizing costs



MPR



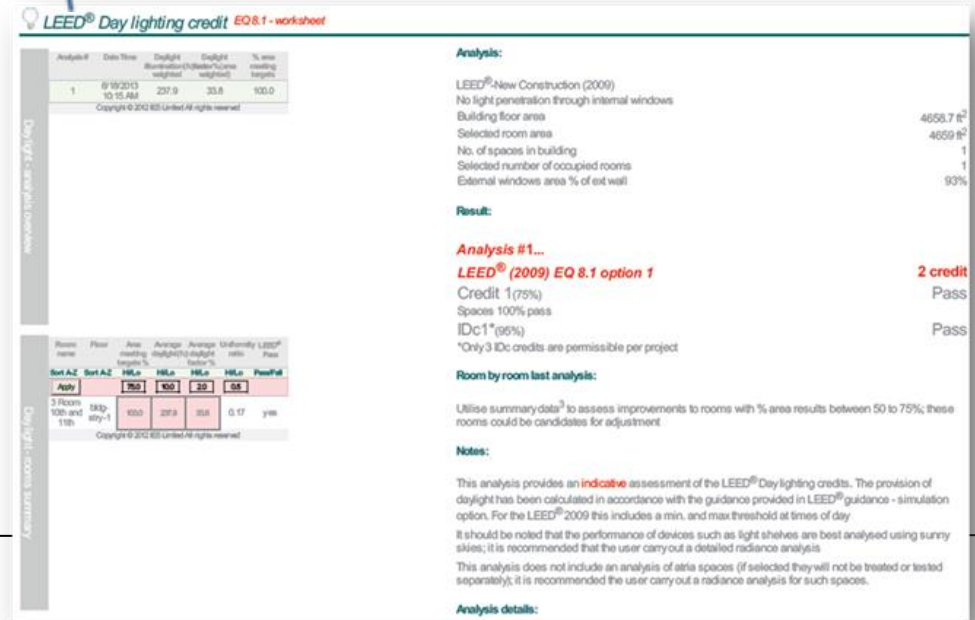
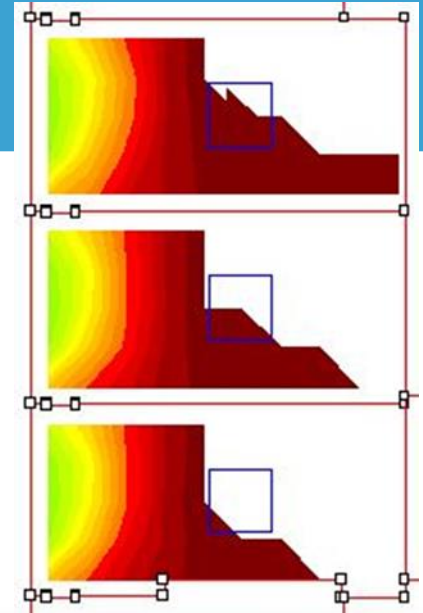
Typical Office

Green Building Compliance

Deliverable Exhibits Include

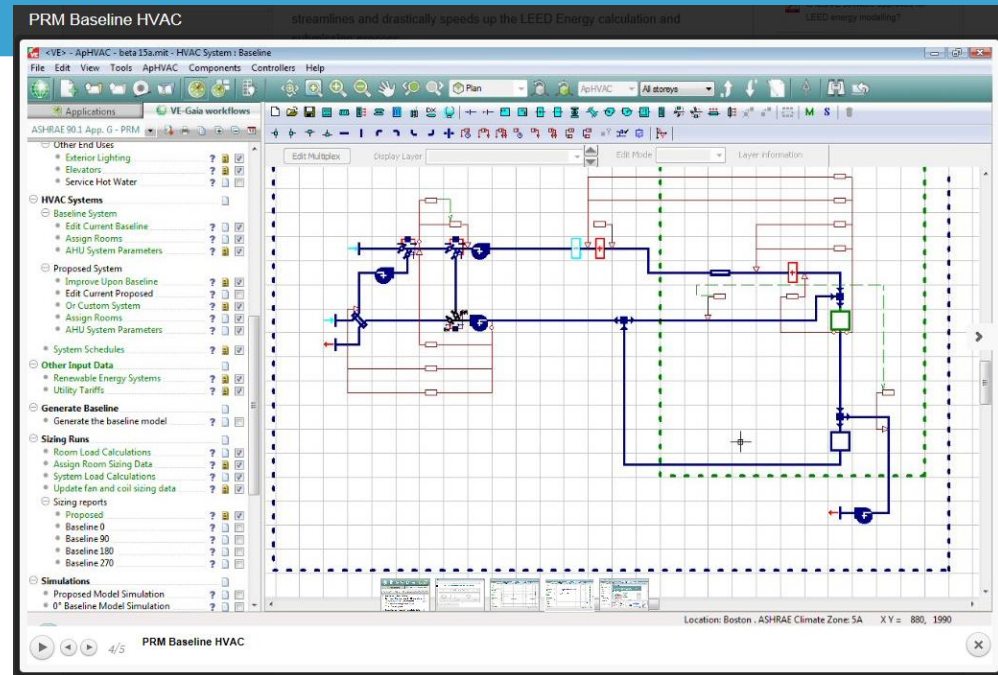
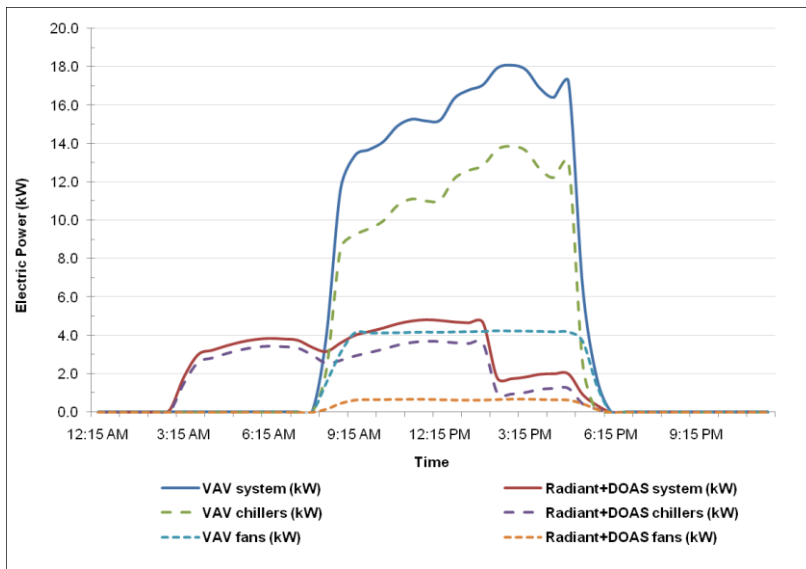
- ✓ ALL prerequisites
- ✓ EAc1.1 – Lighting Density
- ✓ EAc1.2 – Lighting Controls
- ✓ EQc6 - Controllability
- ✓ EQc7.1 – Thermal Comfort
- ✓ EQc7.2 – Thermal Comfort Verification
- ✓ EQc8.1 – Daylight
- ✓ EQc8.2 – Views
- ✓ WEcALL – Water Credits
- ✓ Renewables
- ✓ Materiality
- ✓ Carbon Footprint

Model-based LEED credit tracking



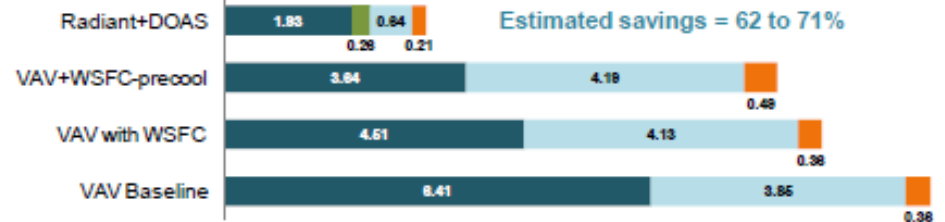
Energy Code Compliance

- ✓ Evaluate HVAC solutions
- ✓ Evaluate lighting density
- ✓ Model 4 scenarios at once
- ✓ Balance upfront cost with long term savings



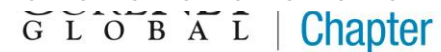
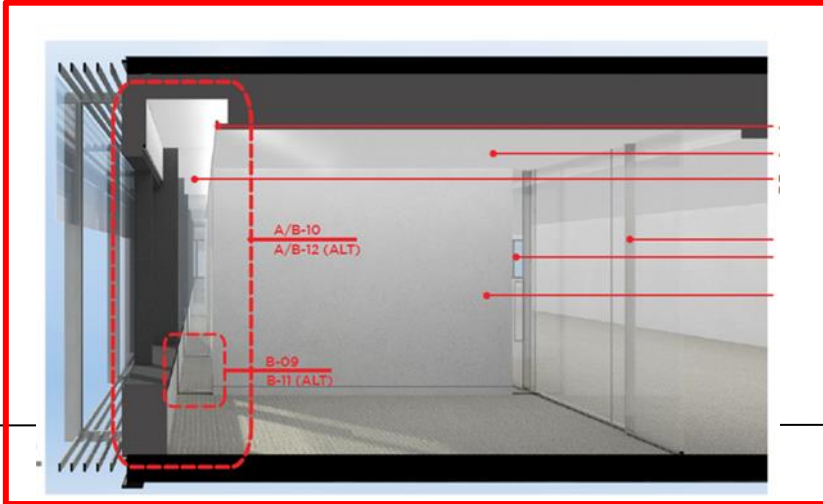
Cooling Season HVAC System Energy

May – September Denver, Colorado (TMY climate data)



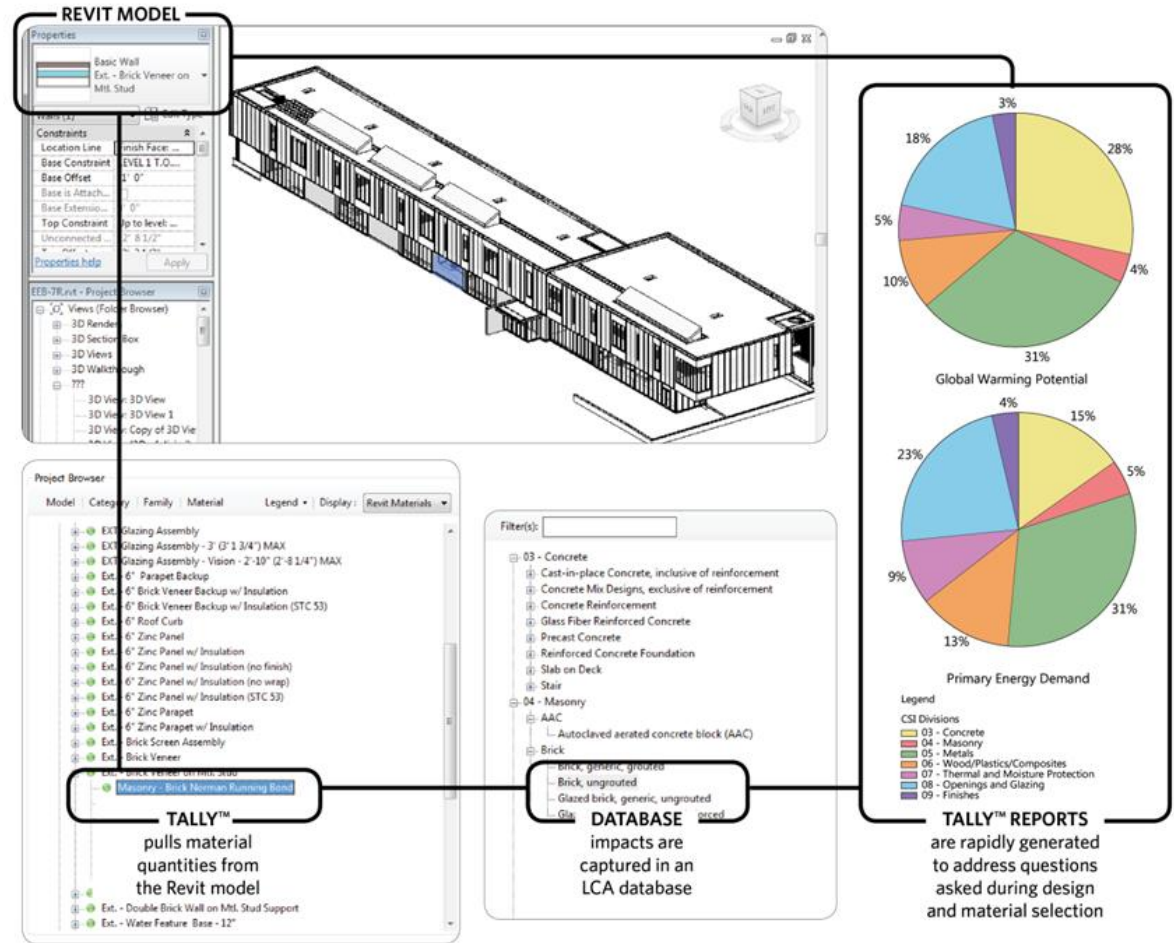
- Chillers (VAV only), cooling towers, and chilled water pumps (MWh)
- Hydronic system pumps and evaporative cooling spray pump (MWh)
- Fans (including cooling tower fan for waterside free cooling) (MWh)
- Boilers, natural gas (MWh)

- ✓ Thermal Comfort Predictability
- ✓ Design is 6% credit maximum is 20%



Carbon Footprint

- ✓ Whole building life cycle assessment
- ✓ Uses Life Cycle Assessment tools to prove credit compliance
- ✓ Uses a baseline case and design case.
- ✓ 10% reduction in two of the impact indicator categories.
- ✓ Provide portfolio footprint



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Questions?




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