

SEBIZ RFI RESPONSE

*Technologies Included in this Response:
Energy Management Systems, Energy Storage Technologies*

BuildingIQ

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Section 1: Company Background and Qualifications

BuildingIQ offers an innovative energy efficiency software solution to optimize HVAC energy in a wide variety of medium to large buildings. Our Predictive Energy Optimization (PEO) software is cloud-based, deployable across a wide-range of building sizes, ages, and types, and is architected for scale across thousands of buildings. The software overlays the existing building automation system (BAS). It makes macro level, supervisory decisions for the BAS based on a learned, building-specific model, predictive algorithms and advanced control strategies.

The software leverages data from:

1. weather forecasts,
2. utility rates,
3. demand signals,
4. building envelope performance,
5. plant performance
6. thermal capacity and
7. occupant schedules

Using advanced machine learning techniques, the buildings ‘model’ is continuously updated to adapt to changes. BuildingIQ will have a measurable and immediate impact on energy and carbon reduction goals, reduce the strain on the grid and generate positive cash-flow without upfront capital expenditure (capex). Our technology is relatively new, but has attracted the financial backing of leading building and grid automation companies such as Siemens, Schneider-Electric and Alstom.

BuildingIQ’s PEO technology is the result of many tens of man-years of R&D from Australia’s National Labs and BuildingIQ’s own technical teams, and over \$5m of investment in product development. These investments have been made to ensure technical scalability, as well as in minimizing the cost, time and complexity in installing, running and providing support to our applications.

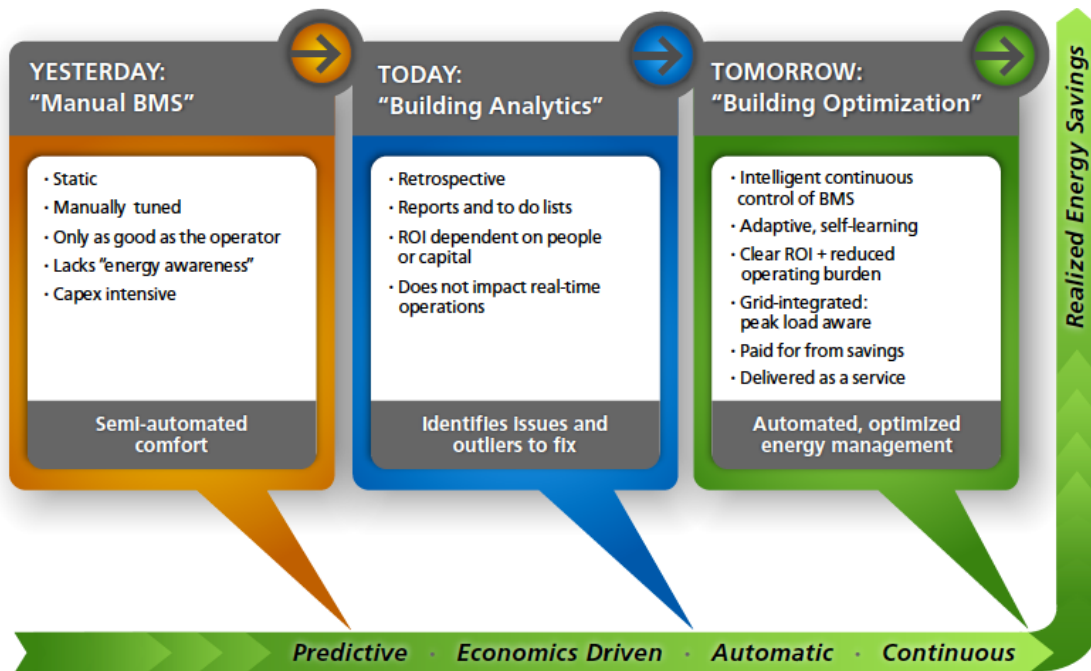
While PEO is a unique and differentiated technology, the solution co-exists alongside an ecosystem of building energy management vendors, utilities and consultants that also play a key role in improving performance in buildings. As a result, while BuildingIQ does sell its solution direct to large portfolio owners, it also works closely with other vendors to sell PEO as a value-add to the existing equipment or services already in place. In late 2012, both Siemens and Schneider-Electric invested in the Company as part of a channel strategy, and BuildingIQ works with Honeywell, Johnson Controls and a number of smaller SIs and vendors as well. Lastly, BuildingIQ is selling through utilities, who offer PEO as an integrated EE / AutoDR product to reduce strain on the grid.

As described above, BuildingIQ is applicable to a wide range of commercial buildings, with the only limitations being the existence of an addressable BAS and mechanical

system type (central plant and large package units). However, the other key requirement for adoption is that the building operating staff and other related consultants/ vendors support the solution and are open to this new level of intelligent automation in managing the BAS and HVAC performance. To address this, our own implementation team have significant building operation and controls experience, work closely with the building staff to ensure success, and have a process-driven approach to system rollout and ongoing support.

Innovation and Impacts:

The current state of the market is dominated with legacy control systems and associated approaches. Largely built on control technology now over 100 years old, the majority of digitally controlled buildings have no awareness of the systems which they are controlling and, furthermore, no awareness of external influences such as the price of power, the thermal capacity of the building, the status of the grid or the near term weather.



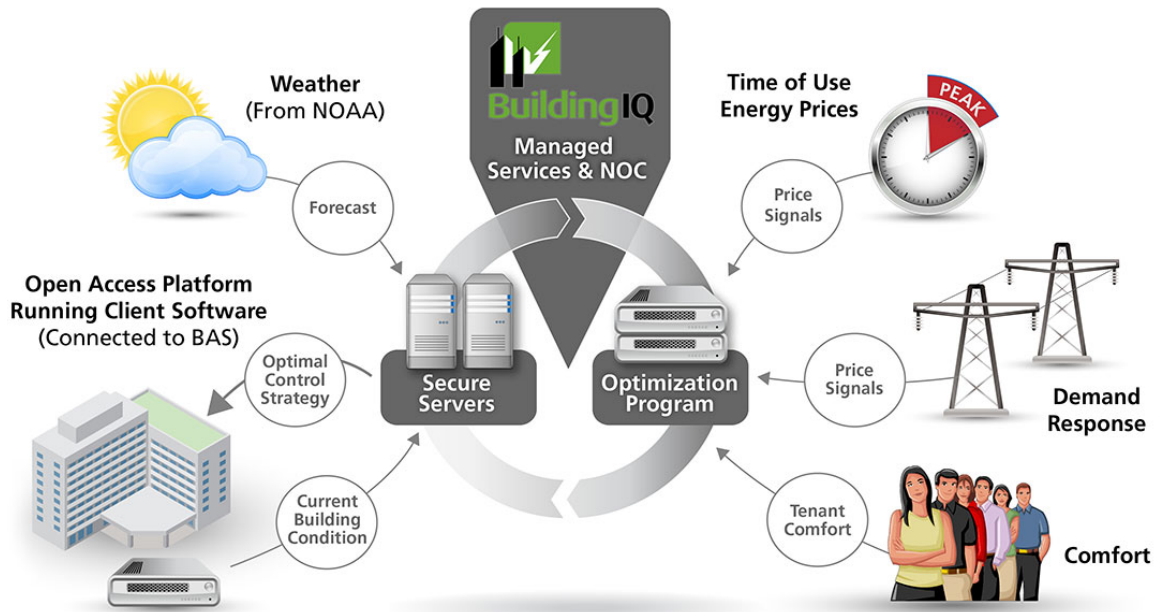
In terms of the core BuildingIQ technology, the advantages of PEO over traditional, legacy building operations relate to system awareness and complex optimization. Through the continuous modeling approach used by PEO, building specific awareness is generated that provides PEO with the insight to know the impact of proposed modulations within the building. When combined with complex mathematical optimization, the weather forecast and power pricing can be combined with the building specific model in an optimization process that tests many thousands of possible operating profiles so as to converge on the lowest cost operating plan for the next 24 hours.

Operations in China

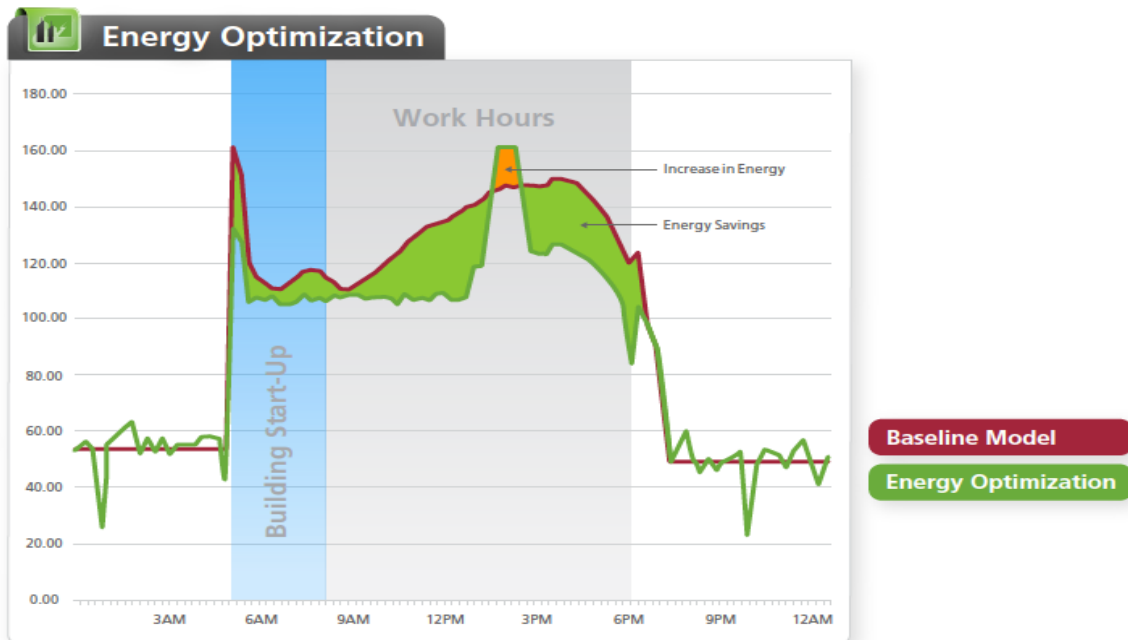
BuildingIQ currently has operational resources in New Jersey, Las Vegas and San Francisco USA as well as Sydney Australia.

For expansion into the Chinese market, BuildingIQ is looking to set up operations in China. A Network Operations Centre (NOC) would be setup either directly by BuildingIQ or through a suitable, local partner. Developing this local resource would be a critical component for successfully supporting and deploying the technology in the region.

Section 2: Proposed Product and Service Description



BuildingIQ’s PEO software integrates with a building’s BAS to strategically direct HVAC energy use and reduce consumption while maintaining comfort. PEO algorithms combine building data with additional information such as weather forecasts, utility rates, occupancy schedules and DR signals (if present) to calculate the optimal HVAC settings for the next 24 hours. Based on a customized, machine learning model for each site, the software then changes selected set points in the BAS to optimize energy use in real-time. Calculations are updated every few minutes to adapt to changes in conditions.

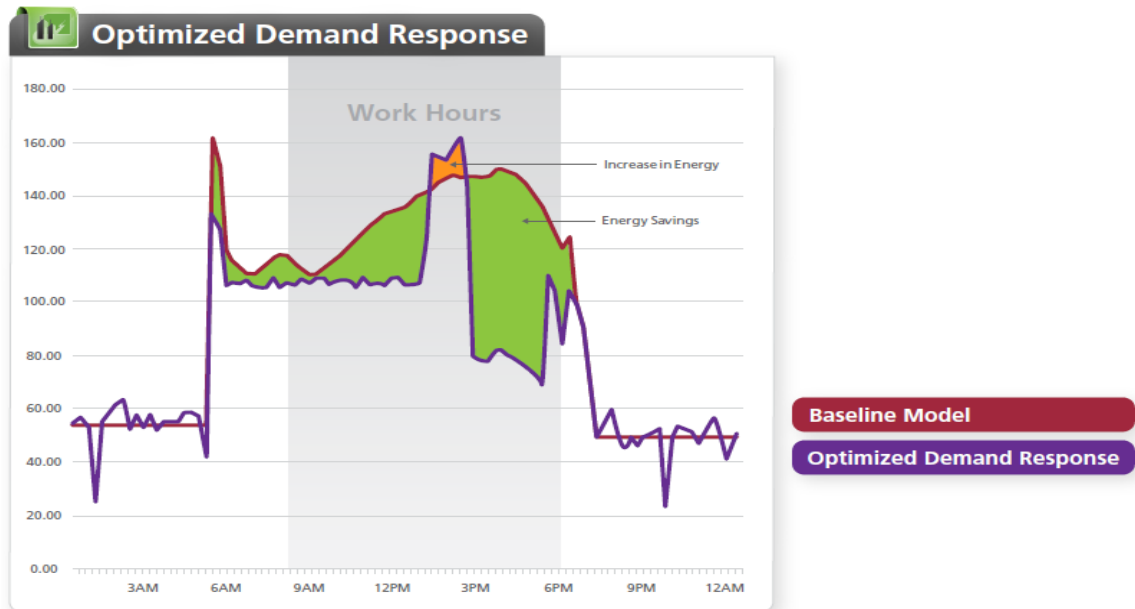


BuildingIQ's software is comprised of:

- Adaptive Energy Modeling: Software-based modeling algorithm automatically learns the building's thermal and mechanical characteristics. This model is updated daily.
- Forecasting and Optimisation engine: Incorporates weather forecasts, utility data, building dynamics and proprietary algorithms to create an optimal forecast for building energy usage, cost and occupant comfort.
- Automated supervisory BAS management: An on-site gateway interfaces to all major BAS via Web Services, BACNET and OPC to read/ write data and control the energy use in real-time. Local cache of control sequences ensure redundancy. Successful integration to date with Schneider, Siemens, ALC, Alerton, Trane, Tridium, Honeywell and JCI BAS to date.
- Remote monitoring, reporting and workflow: Buildings are monitored by operations experts through scalable, web-based software. BAS, meter and other data viewable in a standard user-interface regardless of underlying BAS, building or mechanical equipment. Configuration and BAS access via the software to minimize time / cost of installation or on-site service.

Automated Demand Response (AutoDR): BuildingIQ's PEO enables AutoDR leveraging the same technology platform and an integrated OpenADR module. DR signals are incorporated into the optimization calculation to minimize loads during events. The DR module has the following advantages:

- No custom engineering, programming or hardware required thereby minimizing site by site enablement costs
- Significant HVAC load made accessible for DR, increasing benefits to grid
- Comfort issues minimized, reducing risk to occupants
- "Day ahead", "day of" and "fast DR" possible
- Works with real-time pricing, critical peak-pricing or similar programs



BuildingIQ is a dramatic improvement over current building EE initiatives such as:

- Retro-commissioning: manually intensive, requires upfront capex, and performance improved only until building starts drifting again.
- Equipment upgrades: requires upfront capex, with ongoing performance and ROI uncertain.
- Energy dashboards, fault diagnostics, analytics: improves visibility and identifies issues, but complex to install and manage, and still requires manual intervention and capex to turn data into savings. Can increase staff workload, not reduce it.

BuildingIQ innovations:

- Real-time automated control delivers savings, not reports
- Software runs continuously, learning and adapting to ensure continued performance
- Opex fee model, removing upfront capex and uncertainty around ROI
- Installed in days, running in weeks, with managed service to reduce staff burden

BuildingIQ is also future-proof by handling Demand Response, Critical Peak Pricing and Real-Time Pricing, as well as on-site Distributed Generation and storage as it emerges.

What is Predictive Energy Optimization?

Predictive Energy Optimization (PEO) is the trademarked term for BuildingIQ's software platform designed to improve the energy-efficient operations of large, complex buildings, whether commercial, public, or academic. Running as a software-as-a-service (SaaS), PEO optimizes around system efficiency, occupancy comfort and lowest cost. Energy reductions in the range of 10-25% are typical, with reductions climbing to as high as 40% during operational peaks.

First step—learning

PEO begins with physics—a set of generic rules that govern the heat transfer within all buildings. This forms the core of the model. Then the model's algorithms set about the task of learning the specific dynamic responses of the particular building to a wide variety of continuously changing conditions—everything from temperature and humidity, to occupancy profiles. Measurable data inform hundreds of parameters that monitor and ultimately control the building's dynamic responses.

Day 1 of the learning process begins by comparing actual data to the model's first 24-hour simulation. Early parameter fittings can be miles apart from reality as more data becomes available. The model goes to school. With more information, more comparisons, and what-if combinations, the model tries to bring the model simulations and the actual readings closer together day by day, even as the weather around the building changes. It's a little smarter on the second day, possibly surprised on the third day, a little smarter still on the fourth day, and so on.

Second step—prediction

The BuildingIQ learning process, which is designed to work in concert with the existing building management system (BMS), is one of gradual convergence between parameter based simulations and actual readings. It takes some 4-6 weeks for the model to truly understand the unique dynamics of the building thermodynamically, as people enter and leave, congregate and disperse in various zones, as weather conditions change, and as the train of heating and cooling equipment labors with partial load or hums along at peak efficiency.

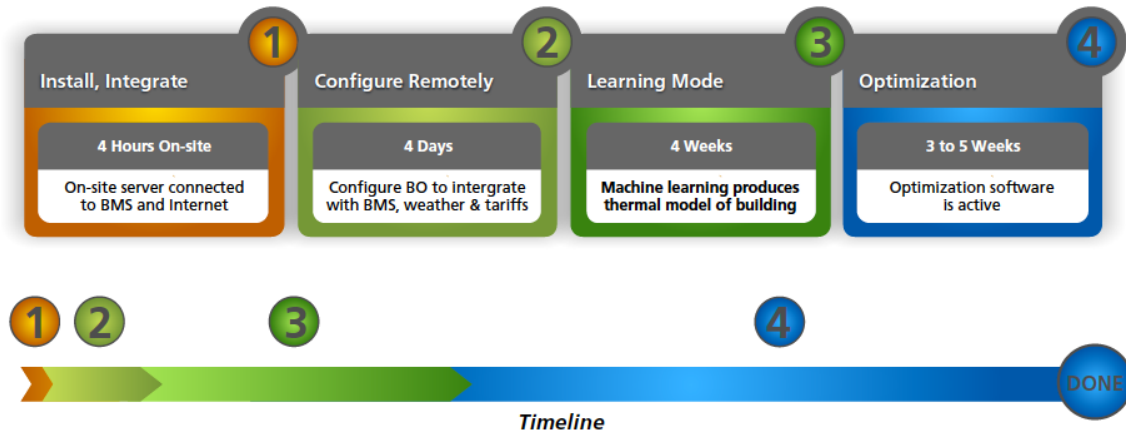
Accurate prediction of the building's thermal behavior, in aggregate and zone by zone, under changing conditions is the precursor to optimization.

Third step: optimization

Tenant comfort is one of the key priorities, but cannot be controlled as an absolute constant, and should not eclipse all other priorities. Multi-functional decision-making is part of the design of PEO.

Temperature can and does vary in a given space by one, two, perhaps even three degrees without noticeable discomfort. This variance, coupled with the ability to predict the building's dynamic response to various contingencies, opens the door to BuildingIQ's optimization of comfort, cost, and efficiency. Knowledge of power prices in the marketplace, as they rise and fall during the day and by season, as well as the economic benefits for participating in demand-response (DR) programs are factored into the decision making process of the model.

The result is the optimum power profile to yield the lowest cost, highest level of HVAC system efficiency, and maximum comfort. The building might be cooled several degrees below midlevel comfort during the morning in order to let the temperature drift upward, while backing off on power demand during peak pricing on a hot afternoon.



Section 3: Proposed Financing Methods

BuildingIQ is delivered as service which delivers more in savings than the cost of the service. As such, BuildingIQ is a cash flow positive energy efficiency solution that does not generally require third party financing.

Section 4: Cost Proposal and Representative Savings

BuildingIQ provides savings typically in the range of 10-25% of HVAC cost.

Savings are made up of both energy consumption and energy demand reductions. Please see attached case studies for additional details.

Beyond the direct energy savings for client buildings, BuildingIQ also addresses some significant market issues

1. Scaling initiatives across a portfolio, not just in the largest and most modern facilities, and
2. Maintaining performance by operating facilities as efficiently as possible, so that energy savings gains are not eroded and projected ROIs on investments can be met.

BuildingIQ's technology addresses these two additional issues.

First, BuildingIQ's solution will ensure clients achieve their goals as they scale programs across regions and/or portfolios, delivering meaningful, measurable HVAC energy savings in small and large buildings, regardless of the underlying BAS and equipment. With no capex required, and a savings stream that is cash-flow positive in two-three months, the budget for achieving wide-scale portfolio impact becomes much more viable.

Secondly, BuildingIQ's PEO delivers real-time operational impact in a facility, without requiring human intervention to achieve ongoing savings. PEO aids the FM/ building engineer, automating complex BAS management and freeing up resources to focus on other key tasks. PEO not only scales across the portfolio but also runs persistently, ensuring the facility's mechanical systems are running as efficiently as possible, ensuring maximum ROI on upgrades or fixes.

Providing firm estimates is difficult without more specific building and portfolio details, but BuildingIQ currently delivers an average 17% ongoing HVAC energy savings across its diverse international portfolio.

In terms of Return on Investment, these savings typically represent an ROI on the service costs of between 125% and 300%.

Attachment A: Company Qualifications Questionnaire

Company Background

Company Name	BuildingIQ
Address	1065 East Hillsdale Blvd, Suite 310
City State Postal Code	Foster City, California 94404
Other Major Locations	46 Market Street, Sydney Australia 1 Harmon Plaza, New Jersey USA
Website	www.buildingiq.com
Number of Employees (2013)	35
Number of Years in Operation	5
Number of Years in Operation (in China)	0
Description of Operations in China	None
Description of Operations in the US	Corporate HQ Sales and Marketing Product Management Operations
Primary Products/Services	Predictive Energy Optimization Remote Energy Efficiency Managed Service
Primary Markets/Customers	Utilities Real Estate Investment Trusts Federal, State and Municipal Government Health Care Energy Service Companies

Company Contact Person

Office Location	1065 East Hillsdale Blvd, Suite 310 Foster City, California 94404
Name	Peter Dickinson
Title	Chief Technology Officer
Email	peterd@buildingiq.com
Phone	+1 415 233 2306

Customers Using Proposed Technology

Project 1

Client Name	M Resort and Casino
Technology and Project Size	See attached
Project Location	Las Vegas, Nevada USA
Project Contact Name	
Title	
Email	
Phone	

Project 2

Client Name	Mount Pleasant Shopping Centre
Technology and Project Size	See attached
Project Location	Australia
Project Contact Name	
Title	
Email	
Phone	

Project 3

Client Name	US Federal Government Building
Technology and Project Size	See attached
Project Location	North East USA
Project Contact Name	
Title	
Email	
Phone	

Company Certifications

Certifications that the company has obtained and/or meets in China and globally	No applicable software or hardware certifications
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Financing

Available Financing Methods	Zero cost installation for 36 month service contract.
Project Financing Partners	Not applicable

Attachment B: Cost Proposal Forms

	WIZ Business District	Yes/No	GDL Business District	Yes/No
Building energy management systems	10 building owners with 45 individual facilities are interested in upgrading their buildings.	Yes	Seeking vendors that sell advanced energy management and automation hardware and software, such heating, cooling and lighting controls	Yes
Energy storage	---	---	Seeking vendors that sell advance energy storage systems for building optimization and resiliency, demand side management, EV's, etc.	Yes

Business District: [YES] WIZ [YES] GDL

Cost Proposal Form:
Building Energy Management System,
Energy Storage

#	Product/Service Technology	(B) Unit Description	(C) Direct Purchase Cost Per Unit	(D) Financing Available	(E) Expected Energy Offset
1	BuildingIQ Predictive Energy Optimization and Managed Service	Software, monitoring, maintenance, support, upgrades.	USD\$0.12 per square foot per year, 36 month contract.	Not required. Free installation for 36 month contract, otherwise cashflow positive	125% to 300% return on investment

Explanation of Pricing and Financing Options:

BuildingIQ's Predictive Energy Optimization (PEO) and energy efficiency managed services are delivered as a cash-flow positive Software as a Service (SaaS) solution.

Financing is not generally required as all upfront costs are covered by BuildingIQ for customers that sign a 36 month service agreement.

Financial returns in the range 125% - 300% are expected from the service from the corresponding energy and demand reductions. Additional savings may be available depending on utility rebates and participation in available programs.