FORRESTER®

The Total Economic Impact™ Of Johnson Controls OpenBlue

Cost Savings And Business Benefits Enabled By OpenBlue And FM:Systems Solutions

A Forrester Total Economic Impact™ Study
Commissioned By Johnson Controls, April 2025

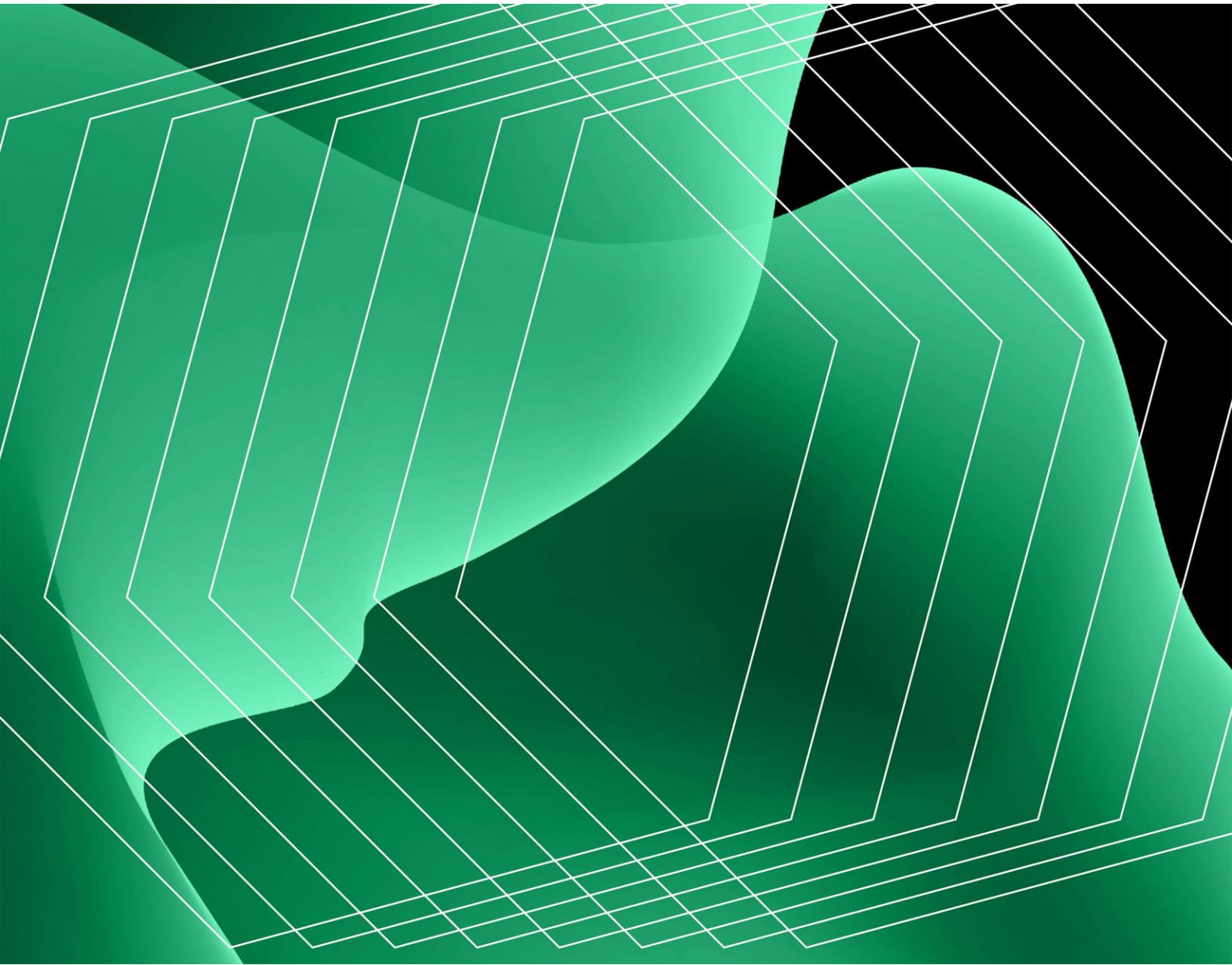

Table Of Contents

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ABOUT FORRESTER CONSULTING

Forrester provides independent and objective research-based consulting to help leaders deliver key outcomes. Fueled by our customer-obsessed research, Forrester's seasoned consultants partner with leaders to execute their specific priorities using a unique engagement model that ensures lasting impact. For more information, visit forrester.com/consulting.

Executive Summary

Businesses are under pressure to reduce costs as a means of profit generation, while at the same time maintaining a high level of employee experience to meet the demands of shareholders and retain talent. Johnson Controls' smart building solutions provide businesses with a better understanding of their expenses, climate impact, and employee experience, enabling them to respond to the demands of their many stakeholders in an integrated and cost-effective manner.

Johnson Controls offers OpenBlue — a smart building technology platform that is OEM-agnostic, letting businesses gather and analyze data from multiple sources, regardless of vendor — and delivers insights on how these businesses can best optimize energy costs, carbon emissions, and maintenance costs. Johnson Controls OpenBlue also includes FM:Systems solutions, a suite of space and facility management solutions, which businesses use to reduce costs, manage workplaces, improve employee experience, plan space efficiently, and increase enterprisewide productivity.

Johnson Controls commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying OpenBlue and FM:Systems solutions.[1] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of OpenBlue and FM:Systems solutions on their organizations.

Return on investment (ROI)
155%

Net present value (NPV)
$6.7 million

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed five decision-makers with experience using OpenBlue and FM:Systems solutions. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization that is a real estate investment and

development organization with 1,800 total employees and 50 million square feet of assets under management.

Interviewees said that prior to using OpenBlue and FM:Systems solutions, their organizations lacked any sort of unified view or cohesive understanding that would enable businesswide real estate-related cost, revenue, and brand optimization strategies. Additionally, the interviewees' organizations were under competitive pressures to not only maintain profits but also be seen as market leaders, particularly as it related to innovation and environmental impact. Lastly, shifts in workplace policies between remote, hybrid, and return-to-work created new challenges regarding workspace utilization that most customers had not previously considered.

After the investment in OpenBlue and FM:Systems solutions, the interviewees gained a unified view into energy utilization, carbon emissions, and workspace utilization to meet the various demands on shareholders, employees, and customers. The interviewees were able to pinpoint the causes of energy costs and energy waste, reducing these, while also saving on real estate costs by analyzing and optimizing their workspace use. Furthermore, customers in the real estate industry were able to improve their revenues by gaining rental premiums on buildings that were smart building- and green-certified thanks to the insights provided by Johnson Controls' smart building solutions.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Energy savings of up to 10%.** With a unified view into its building operations across its portfolio of properties and a real-time understanding of energy usage, the composite organization is able to optimize its use of energy both during business hours and after hours to reduce its overall energy expenditures by a three-year present value of $3 million.
- **Reduced chiller maintenance costs by 67%.** With real-time insights into the uptime of any given piece of equipment, the composite can optimize its use of maintenance services. Instead of paying for regular service checks and maintenance work, the composite now only requires service and maintenance work if and when a machine breaks or when OpenBlue recognizes that service is needed to avoid downtime. By moving from monthly service to quarterly service, the composite reduces its maintenance spend on chillers by nearly $1.5 million in present value over three years.

- **Leased real estate savings of 21.9%.** As the composite has, for the first time, a solution in place that can track and analyze its workspace utilization, it can make the most of its owned real estate and reduce its expenses on rented office space. With FM:Systems solutions, the composite is able to redeploy owned office space for use by employees who previously were in rented spaces for a three-year present value of $3.5 million.
- **Increased rental premiums by 7%.** Lastly, the composite leverages OpenBlue to improve the smart technology and environmental impact standing of its properties. After doing so, the composite applies for smart building and green building certifications. For those buildings that receive such certifications, the composite receives average rental premiums of 8% and 4%, respectively. With OpenBlue being 60% responsible for the certifications, the composite improves its profits by a three-year present value of $3.2 million.

Unquantified benefits. Benefits that provide value for the composite organization but are not quantified for this study include:

- **Reduced carbon emissions.** The composite is able to gather and analyze its carbon emissions with OpenBlue. It then utilizes this data in its marketing, shareholder presentations, and building and business certifications, enabling it to have a better reputation among shareholders, employees, and customers.
- **Shareholder value.** The composite further enhances shareholder value by leveraging OpenBlue to gain rental premiums from building certifications, which then enhance the value of the composite's asset portfolio and in turn increases shareholder value.
- **Technology savings.** After deploying OpenBlue, the composite decommissions its prior data warehouse and leverages OpenBlue for the same purpose, saving on the prior costs of its data warehouse.

Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **OpenBlue and FM:Systems solutions fees.** The composite pays Johnson Controls one-time implementation and deployment fees for each system in each building where it is deployed. It also pays ongoing licensing and service fees based on the number of users of the technologies, the features deployed, and the amount of equipment analyzed.

- **Internal labor costs.** The composite experiences internal labor costs associated with assisting Johnson Controls in the rollout of OpenBlue and FM:Systems solutions, the time cost of training employees on using OpenBlue and FM:Systems solutions, and the ongoing cost of the full-time equivalents necessary to manage these solutions on an ongoing basis.

The decision-maker interviews and financial analysis found that a composite organization experiences benefits of $11 million over three years versus costs of $4.3 million, adding up to a net present value (NPV) of $6.7 million and an ROI of 155%.

Return on investment (ROI)

155%

Benefits PV

$11 million

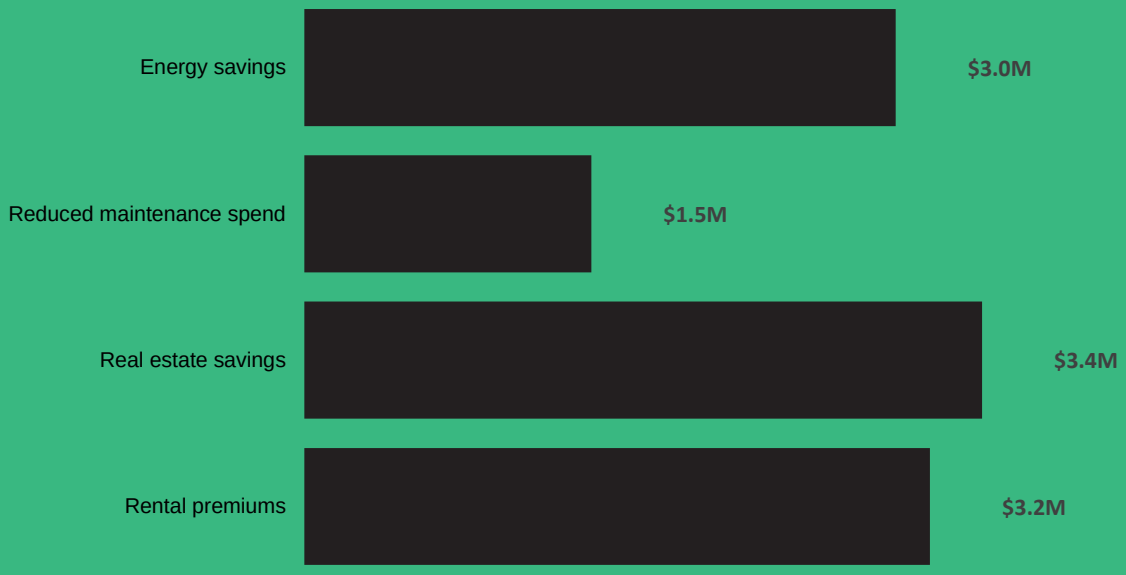
Net present value (NPV)

$6.7 million

Payback

8 months

Benefits (Three-Year)



TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in OpenBlue and FM:Systems solutions.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that OpenBlue and FM:Systems solutions can have on an organization.

DISCLOSURES
Readers should be aware of the following:

This study is commissioned by Johnson Controls and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in OpenBlue and FM:Systems solutions.

Johnson Controls reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Johnson Controls provided the customer names for the interviews but did not participate in the interviews.

Due Diligence
Interviewed Johnson Controls stakeholders and Forrester analysts to gather data relative to OpenBlue and FM:Systems solutions.

Interviews
Interviewed five people at organizations using OpenBlue, one of which also used FM:Systems solutions, to obtain data about costs, benefits, and risks.

Composite Organization
Designed a composite organization based on characteristics of the interviewees' organizations.

Financial Model Framework
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.

Case Study
Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The Johnson Controls OpenBlue and FM:Systems solutions Customer Journey

Interviews			
Role	**Industry**	**Region**	**Employees**
Digital and innovation manager	Real estate	EMEA	200
VP of strategy	Healthcare	North America	1,800
Director of corporate services	Financial services	North America	3,500
Product and program manager	Real estate	Asia Pacific	12,000
Workplace technology architect	Pharmaceuticals	Global	88,000

KEY CHALLENGES

Before investing in OpenBlue, the interviewees described having disparate building management solutions with little to no integration between them. They also shared having no technology solutions analyzing workforce usage of real estate prior to implementing FM:Systems solutions.

The interviewees noted how their organizations struggled with common challenges, including:

- **Lack of a unified view.** The interviewees shared that before investing in OpenBlue or FM:Systems solutions, they had no reliable, unified view into their aggregated facilities costs, energy usage, carbon emissions, or workplace utilization. Each building for the most part operated in its own silo, so while some buildings performed well based on corporate or market expectations, others performed poorly. There was no real ability to understand what was driving the variation in performance.
- **Competitive pressures.** Those interviewees operating in the real estate investment or development industries specifically shared that they were facing competitor and customer pressures to further invest in smart building and green technologies. Such

investments were becoming table stakes for their clients when assessing which office or commercial spaces to lease or buy. Additionally, these firms recognized that they could realize additional savings as gains to income by better managing the facilities they offered clients and profiting from the rental premiums gained from leasing smart- and green-certified buildings.

- **Shift in workplace culture.** When discussing FM:Systems solutions specifically, interviewees noted that their workspace management practices needed to swiftly catch up with the shift in culture and employer attitudes toward working from home instigated by the COVID-19 pandemic. As it became clear that hybrid workforces were here to stay, improving the flexibility of workspace utilization required investing in workspace data capture and analytics solutions like FM:Systems solutions.

> “Johnson Controls' solutions surface relevant information that allows us to then tailor our customer experience as best as possible. Combined with lowering their energy costs and improving carbon emissions, we can give customers the best possible experience in our buildings."
>
> **INNOVATION MANAGER, REAL ESTATE**

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the interviewees’ organizations, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization is a global real estate investment and development organization with its headquarters and a plurality of its real estate under management located in North America. Globally, it has 50 million square feet of commercial and

office space under management. The composite employs a total of 1,800 workers and earns an average of $60 annually per square foot of real estate under management. It also owns 175,000 square feet of office space that it utilizes as its headquarters, housing 1,000 of its employees. For non-headquarters office space, the composite rents space at an average annual rate of $50 per square foot.

Deployment characteristics. The composite organization engages Johnson Controls to implement and deploy smart building technologies in both its commercial and office space under management, as well as into its owned headquarters. OpenBlue is deployed at a rate of 10% coverage per year. The composite begins with its largest buildings to achieve the most savings. As it becomes more efficient at working with Johnson Controls during implementation and deployment, it is able to maintain the 10% per annum deployment rate, even as the number of unique buildings this equates to increases. FM:Systems solutions are deployed in the composite's headquarters only.

Key Assumptions

50 million square feet under management

$60 per square foot annual revenues from assets under management

175,000 owned square feet utilized by employees

$50 per square foot annual cost of non-owned office space

Interview Spotlight: Johnson Controls As An Asset In Public-Private Partnerships

As part of this study, Forrester interviewed the VP of strategy from a North American healthcare organization that leveraged Johnson Controls' smart building solutions in a brand-new 37,000 square foot hospital funded via a public-private partnership with a subnational government in North America. The hospital employs 1,800 workers and is expected to handle around 100,000 emergency department visits, perform 6,300 surgeries, deliver 3,100 babies, and tend to 1,800 pediatric urgent care visits annually.

The interviewee noted, "Johnson Controls was integral to the project from the beginning." He described how this was true even during the bid stage by explaining, "They are the most experienced in the industry in terms of facilities management, and this experience goes well beyond healthcare." Most importantly, however, he said: "[Johnson Controls] is active in the world of public-private partnerships. They know what to expect and had worked out the kinks before they became apparent to us."

Because Johnson Controls was uniquely vertically integrated when compared to the rest of the consideration set, the interviewee shared, "Not only is Johnson Controls supplying the critical, backbone items of facilities management, like chillers, fire security, and automation, but by adding a management layer on top of these, they have provided consistency and solid support." When pressed to describe the support that Johnson Controls offered, the interviewee responded: "When issues come up, they get into problem-solving mode. We get engagement at all levels of their organization in one shot. Also, surprisingly given the current environment, there has been little to no turnover in the Johnson Controls folks on the ground managing the site."

When the interviewee compared the hospital to its peers, he said: "Johnson Controls has enabled us to perform in a standout manner. In terms of energy efficiency, this hospital is currently ranked number two in [the subnational region] and should be number one by the end of the year." The interviewee explained, "[This performance was because] Johnson Controls is in a different league than other vendors when it comes to its technology and equipment." He described uptime and redundancy as "quite good," and he noted, "If we happen to lose one piece of equipment, we don't see any downstream impact." He continued, "[Not only that, but] the [hospital's] plant has a very efficient plan in place since inception, and Johnson Controls has managed this plant very well since day one."

Analysis Of Benefits

Quantified benefit data as applied to the composite

Total Benefits						
Ref.	**Benefit**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Atr	Energy savings	$621,000	$1,242,000	$1,863,000	$3,726,000	$2,990,691
Btr	Reduced maintenance spend	$301,500	$603,000	$904,500	$1,809,000	$1,452,002
Ctr	Real estate savings	$1,379,700	$1,379,700	$1,379,700	$4,139,100	$3,431,110
Dtr	Rental premiums	$0	$1,620,000	$2,430,000	$4,050,000	$3,164,538
	Total benefits (risk-adjusted)	$2,302,200	$4,844,700	$6,577,200	$13,724,100	$11,038,341

ENERGY SAVINGS

Evidence and data. Before deploying OpenBlue, the interviewees noted that they lacked an aggregate understanding of the performance of their facilities regarding energy efficiency. They could track their energy spend but could not get the detail or breadth of view necessary to understand how to decrease their energy waste, save on spend, and improve their environmental impact without hurting employee productivity across their portfolio of buildings.

After deploying OpenBlue, the interviewees described saving on energy costs by responding to issues in real time and by implementing the best practices of certain facilities across their wider portfolio. For example, the workplace technology architect from the pharmaceuticals organization said: “Our facilities managers only had insights as to how much energy their buildings used once they got the bill, which was way too late to do anything about it. With OpenBlue, they get energy usage updates every day. If abnormal energy consumption is detected, it raises a real-time alarm and enables our staff to solve the issue.”

The digital and innovation manager from the real estate industry shared: “OpenBlue has saved us up to 10% on our energy costs. We did some other work to reduce these costs but, as an example, OpenBlue showed us out-of-hours lighting was costing $17,000 per floor of our buildings. Without that insight, we wouldn’t have been able to take action to reduce those expenses and that energy waste.”

The interviewees:

- Realized 2% savings on their “already very efficient” monthly energy expenses out of a 4.5% potential savings, reduced at their discretion. Given a 5% increase in energy prices, the decreases were closer to 7% realized on 9.5% potential. (Product and program manager, real estate)
- Saved $50,000 per year from plant optimization as informed by building utilization data from their headquarters building. (Workplace technology architect, pharmaceuticals)
- Saved up to 10% on their energy costs and as much as $248,000 annually for a single building. (Digital and innovation manager, real estate)

Modeling and assumptions. Based on the composite organization and the interviews, Forrester models:

- Total assets under management equal 50 million square feet of real estate.
- The average annual energy cost per square foot is $2.30.
- The percentage of square footage analyzed by OpenBlue increases from 10% in Year 1 to 30% in Year 3.
- The composite realizes energy savings of up to 10% from OpenBlue, with a conservative 60% of those being identifiably attributable to it. Given the average increase in energy rates of 19% between 2020 and 2023, OpenBlue may effectively decrease energy costs by a larger net percentage, up to 29%.

Risks. The total amount of energy savings will vary with:

- The total amount of space analyzed by OpenBlue and the deployment and implementation rate of the technology.
- The ability of the customer to quickly implement optimization strategies as informed by OpenBlue’s analytics.
- The actual cost of energy for the buildings where OpenBlue is deployed, and any changes in utility rates.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $3 million.

Up to 10%

Energy savings

Energy Savings					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Total square feet under management	Composite	50,000,000	50,000,000	50,000,000
A2	Average energy price per square foot	Composite	$2.30	$2.30	$2.30
A3	Percentage of square footage onboarded	Composite	10%	20%	30%
A4	Reduction in energy costs	Interviews	10%	10%	10%
A5	Conservative estimation of OpenBlue contribution to benefit	Composite	60%	60%	60%
At	Energy savings	A1*A2*A3*A5	$690,000	$1,380,000	$2,070,000
	Risk adjustment	↓10%			
Atr	Energy savings (risk-adjusted)		$621,000	$1,242,000	$1,863,000
	Three-year total: $3,726,000			**Three-year present value: $2,990,691**	

REDUCED CHILLER MAINTENANCE SPEND

Evidence and data. Thanks to gathering more and better data regarding their facilities use, interviewed Johnson Controls customers were also able to reduce their expenditures on maintenance of facilities and equipment. As OpenBlue enables customers to have real-time insights into the performance of their plant equipment, customers no longer needed to regularly physically check equipment or pay for service providers to do so. They instead utilized OpenBlue to provide them updates and, should an issue arise, only then pay for an internal or external team to solve the problem.

The starkest example of this was the reduction in maintenance required for chillers. For example, the product and program manager from the real estate industry shared: “OpenBlue provides us such visibility into the performance of our chillers that we’ve been able to reduce our maintenance contracts from monthly intervals to quarterly ones. We use OpenBlue to check this equipment daily and now utilize our maintenance service providers on average four times a year. Before, we would have them regularly come in once a month to check our equipment and deliver any necessary services.”

The same customer also noted that the facilities workers they employed saved an unquantifiable amount of their time thanks to OpenBlue. They said: “Anecdotally, the facilities management team has shared saving a few hours per staff member thanks to OpenBlue. For example, they now receive consumption data and can easily compare it to historical data in real time. Each step of the analysis process is faster and easier. They have more and better data to act upon and receive it much earlier than before.

The workplace technology architect also noted similar unquantified savings: “We now have data for multiple systems available through a single pane of glass. These insights gathered from a combination of sources and delivered in a unified view enable our facility managers to act quickly without the need to wait for and gather the required data on their own.”

Modeling and assumptions. Based on the composite organization and the interviews, Forrester models:

- Total chiller capacity of 500 tons per square foot of space, or 100,000 tons in total for the composite.
- Average annual maintenance cost of $50 per ton of chiller capacity.
- A reduction in chiller maintenance service provider use from monthly to quarterly, reducing these costs by 67%.

Risks. Total reduced maintenance spend will vary with:

- Total chiller capacity based on population and environmental factors.
- Average cost of annual maintenance per ton of chiller capacity.
- Whether the customer is locked into an annual maintenance contract or can reduce service costs within the annual period.

- The ability of the customer to quickly implement optimization strategies as informed by OpenBlue's analytics.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.5 million.

> **67%**
>
> Reduced chiller maintenance service spend

Reduced Maintenance Spend					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Total chiller capacity (tons)	Composite	100,000	100,000	100,000
B2	Cost of maintenance per ton of chiller capacity	Composite	$50	$50	$50
B3	Percentage deployed	A3	10%	20%	30%
B4	Reduction in maintenance cost	Interviews	67%	67%	67%
Bt	Reduced maintenance spend	B1*B2*B3*B4	$335,000	$670,000	$1,005,000
	Risk adjustment	↓10%			
Btr	Reduced maintenance spend (risk-adjusted)		$301,500	$603,000	$904,500
	Three-year total: $1,809,000			**Three-year present value: $1,452,002**	

REAL ESTATE SAVINGS

Evidence and data. Before deploying FM:Systems solutions, interviewees failed to understand both the specifics and the aggregate view of how their workspaces were being used by employees. In fact, few customers even realized they should be analyzing this until their businesses adopted hybrid workforce policies after the COVID-19 pandemic. After adopting these policies and FM:Systems solutions, customers were able to granularly understand the

space needed to fully accommodate their workforces under a hybrid system, even as these organizations' workforces grew.

For example, the director of corporate services from the financial services organization noted being able to save on actually incurred real estate costs while also avoiding potential costs of employee growth. They said: "Even though we only use FM:Systems solutions in our two owned properties, we were able to quickly get quantified data as to how these spaces were utilized such that we were able to take employees from leased properties and rehouse them in our owned properties. This has saved us almost $60,000 per month on rent." The interviewee shared that they were able to get all of this done in one year, whereas if they were to manually gather the data, it would have taken several years.

The same interviewee noted that their organization was also able to accommodate additional new hires in the same owned properties because of both FM:Systems solutions and the adoption of hybrid workforce policies. Based on customer and Forrester data, this could have saved the customer an additional, hypothetical $7.9 million annually in real estate costs at 900 workers needing 175 square feet of space at an average annual rent of $50 per square foot.

Modeling and assumptions Based on the composite organization and the interviews, Forrester models:

- The composite owns 175,000 square feet of office space that it uses as its headquarters.
- After implementing FM:Systems solutions, it is able to redeploy 17.5% of this space to accommodate employees who were previously working in rented office space.
- It saves 21.9% of its lease costs in this manner.
- The composite spent an average of $50 per year per square foot of rented office space.
- The model assumes a 1:1 correspondence between the space needed for an employee at a leased office building and the space needed for the same employee at an owned office building, which is assumed to be 175 square feet.

Risks. The total value of real estate savings may vary with:

- The total amount of owned real estate.
- The amount of this real estate going underutilized.
- The amount of underutilized real estate actually redeployed based on preference.

- The average annual cost of rented real estate.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $3.4 million.

Real Estate Savings					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
C1	Owned office space dedicated to employee use	Composite	175,000	175,000	175,000
C2	Percentage space recaptured for employee use	Interviews	17.5%	17.5%	17.5%
C3	Leased office space	Composite	140,000	140,000	140,000
C4	Equivalent percentage of leased space saved	C1*C2/C3	21.9%	21.9%	21.9%
C5	Average cost of lease per square foot	Composite	$50	$50	$50
Ct	Real estate savings	C3*C4*C5	$1,533,000	$1,533,000	$1,533,000
	Risk adjustment	↓10%			
Ctr	Real estate savings (risk-adjusted)		$1,379,700	$1,379,700	$1,379,700
	Three-year total: $4,139,100			**Three-year present value: $3,431,110**	

21.9%

Real estate savings

RENTAL PREMIUMS

Evidence and data. In addition to saving on costs for both their portfolio of assets under management and their own office spaces as used by employees, the customer organizations in the real estate investment and development industry also realized improved income from the deployment of OpenBlue. For example, the digital and innovation manager said: “We have leveraged OpenBlue to get various certification for our buildings. For example, we have used it for certain buildings to be SmartScore certified. We estimated that OpenBlue is about 60%

responsible for these buildings achieving certification. We also know that certification gets us a better-quality tenant and a higher rate of income from these tenants."

He continued: "Having OpenBlue deployed in our investment buildings is a major leasing advantage. Before even considering a property, corporate clients will have a list of requirements. Often, this list includes certain smart building and green/energy conservation certifications. Because OpenBlue helps us achieve these certifications, we get more clients in the door, more competition for our buildings, and higher rates due to this competition. We also know the best spaces attract the best tenants, and these tenants are willing to pay a premium regardless."

Modeling and assumptions Based on the composite organization and the interviews, Forrester models:

- The composite's square footage of assets under management covered by OpenBlue grows from 5 million in Year 1 to 15 million by Year 3.
- The average length of rental contract offered by the composite is four years, so on average, 25% of the composite's office space comes up for rental or re-rental any given year.
- The composite's average income per square foot is $60 before being certified with smart technology and green building certifications.
- The composite's operating margin is 20%.
- The average rental premium the composite is able to achieve is 4% for green certification and 8% for smart technology certification.
- These certifications take about a year to achieve for the average building under management.
- OpenBlue is responsible for 60% of the premium from certifications.

Risks. The total value of rental premiums will vary with:

- The total amount of square footage where OpenBlue is deployed.
- The appetite for, length of time necessary, and success of achieving smart building and green certifications.
- The amount of real estate able to be rented in any given year.

- The current average annual revenue per square foot of this real estate and the operating margin.
- The actual premium received from smart building and green certifications.

Results. To account for these risks, Forrester adjusted this benefit downward by 25%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $3.2 million.

Rental Premiums					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	Square footage covered by OpenBlue	A1*A3	5,000,000	10,000,000	15,000,000
D2	Deployed square footage re-rented	D1/4	1,250,000	2,500,000	3,750,000
D3	Average rental income per uncertified square foot	Composite	$60	$60	$60
D4	Operating margin	Composite	20%	20%	20%
D5	Average rental premium from smart and green certifications	Composite	0%	12%	12%
D6	OpenBlue responsibility for certifications	Interviews	60%	60%	60%
Dt	Rental premiums	D2*D3*D4*D5*D6	$0	$2,160,000	$3,240,000
	Risk adjustment	↓25%			
Dtr	Rental premiums (risk-adjusted)		$0	$1,620,000	$2,430,000
	Three-year total: $4,050,000			**Three-year present value: $3,164,538**	

7%

Rental premium from OpenBlue

UNQUANTIFIED BENEFITS

Interviewees mentioned the following additional benefits that their organizations experienced but were not able to quantify:

- **Reduced carbon emissions.** OpenBlue also enabled the interviewees' organizations to track, analyze, and reduce their carbon emissions, which , which contributed to lower energy costs but also resulted in a number of unquantifiable benefits. The digital and innovation manager from the real estate industry said: "We made a brand promise to achieve net-zero carbon by 2030. We have a responsibility to our shareholders and tenants to reduce and eventually eliminate any net-negative impact our business has on the environment." The workplace technology architect from the pharmaceutical industry shared: "We have gained reputational recognition from both Platinum LEED and Well certifications thanks to OpenBlue. We are now seen as a leader in terms of technology adoption that supports our company's ESG initiatives."
- **Shareholder value.** The interviewees also noted that using OpenBlue has resulted in adding unquantified value for their shareholders. For example, the digital and innovation manager said: "For us, shareholder value is contingent on asset value. Our asset value is based on what buyers and lessees are willing to pay for a property. OpenBlue helps us get the certifications that allow us to charge premiums, increasing asset value and therefore shareholder value as well."
- **Technology savings.** Lastly, some interviewees shared being able to reduce their technology expenses by adopting OpenBlue. For example, the product and program manager from the real estate industry noted that once OpenBlue was deployed, the business could leverage it as its core data warehouse, decommissioning and saving costs related to their prior data warehouse.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement OpenBlue and FM:Systems solutions and later realize additional uses and business opportunities, including:

- **Improved competitiveness.** The interviewees noted that Jonson Controls smart building solutions helped them improve their market competitiveness. The digital and innovation manager from the real estate industry said: "OpenBlue allows us to maintain our standing as market leaders. We were first to market with an intelligent building strategy, and there is now an expectation that we will continue to lead the charge."

- **Innovation catalyst.** The interviewees also noted that adopting Johnson Controls smart building solutions enabled them to innovate more. The product and program manager from the real estate industry shared: “Now that we have OpenBlue deployed as a centralized platform for analyzing building performance across our portfolio, we have been able to develop a mobile application for use by our tenants. This app allows them to book shared spaces and attend events at our properties, while also enabling them to provide feedback on their comfort in various spaces. This enables us to respond to our tenants needs in a way we could not before.”

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Analysis Of Costs

Quantified cost data as applied to the composite

Total Costs							
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Etr	OpenBlue and FM:Systems solutions fees	$825,000	$715,000	$1,100,000	$1,485,000	$4,125,000	$3,499,793
Ftr	Internal labor costs	$23,940	$223,881	$335,821	$423,821	$1,007,463	$823,430
	Total costs (risk-adjusted)	$848,940	$938,881	$1,435,821	$1,908,821	$5,132,463	$4,323,223

OPENBLUE AND FM:SYSTEMS SOLUTIONS FEES

Evidence and data. The interviewees shared that paying Johnson Controls fees related to the implementation and ongoing use of both OpenBlue and FM:Systems solutions. For OpenBlue, the customers noted paying higher upfront costs for implementation than for licensing. These costs were also higher in the beginning than they were for ongoing deployment, as most customers chose to deploy to larger properties first.

Modeling and assumptions. Based on the composite and the interviewees, Forrester models:

- Subscription fees totaled $400,000 in Year 1, $750,000 in Year 2, and $1.1 million in Year 3.
- The growth in fees is entirely due to expansion of OpenBlue across a large portfolio of properties, from 5 million square feet of space analyzed in Year 1 to 15 million square feet by Year 3. The composite experiences high CAPEX costs upfront but enjoyed benefits of scaled pricing as the portfolio expanded.
- FM:Systems solutions fees remain the same over time as the composite deploys and utilizes it in the same space over the three years analyzed.
- The composite saves on implementation and deployment fees by having both OpenBlue and FM:Systems solutions implemented and deployed at the same time.

Risks. The total cost of OpenBlue and FM:Systems solutions fees will vary with:

- The total size and rate of deployment of the technologies.
- The number of users of the technologies, the features deployed, and the space covered by the technologies on an ongoing basis.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $3.5 million.

OpenBlue and FM:Systems solutions Fees						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
E1	Subscription fees	Interviews	$0	$400,000	$750,000	$1,100,000
E2	Installation fees	Interviews	$750,000	$250,000	$250,000	$250,000
Et	OpenBlue and FM:Systems solutions fees	E1+E2	$750,000	$650,000	$1,000,000	$1,350,000
	Risk adjustment	↑10%				
Etr	OpenBlue and FM:Systems solutions fees (risk-adjusted)		$825,000	$715,000	$1,100,000	$1,485,000
Three-year total: $4,125,000			**Three-year present value: $3,499,793**			

INTERNAL LABOR COSTS

Evidence and data. In addition to fees charged by Johnson Controls for OpenBlue and FM:Systems solutions, the interviewees also incurred internal labor costs associated with:

- Working alongside Johnson Controls to assist in the implementation and deployment of OpenBlue and FM:Systems solutions.
- Training users on utilizing the solutions.
- Employing the full-time equivalents (FTEs) necessary to manage the solutions on an ongoing basis.

Modeling and assumptions. Based on the composite and the interviews, Forrester models:

- Internal planning and deployment costs of 14 person-hours per week for four months per building at a rate of $80 per hour.

- Thirty minutes of training per facility manager at a fully burdened rate of $50 per hour.
- The need for between one and two FTEs needed to manage the solutions on an ongoing basis at a fully burdened rate of $160,000 annually per FTE.

Risks. The cost of internal labor will vary with:

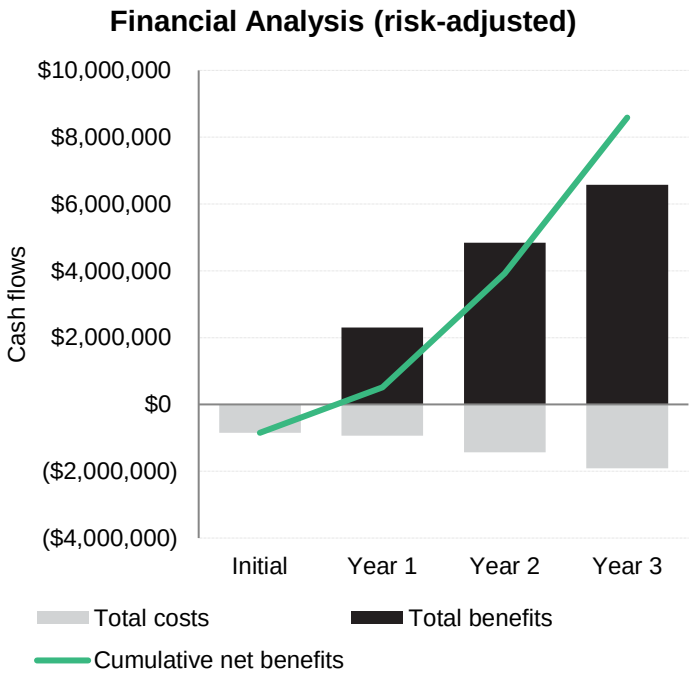
- The amount of effort required to plan for and assist in the deployment of both OpenBlue and FM:Systems solutions.
- The size of OpenBlue and FM:Systems solutions deployments.
- The average rate of pay for the various employees planning, deploying, interacting with, and actively managing OpenBlue and FM:Systems solutions.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $823,000.

Internal Labor Costs						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
F1	Planning and deployment	Interviews	$19,264	$38,528	$57,792	$57,792
F2	Training	Interviews	$2,500	$5,000	$7,500	$7,500
F3	Ongoing management	Interviews	$0	$160,000	$240,000	$320,000
Ft	Internal labor costs	F1+F2+F3	$21,764	$203,528	$305,292	$385,292
	Risk adjustment	↑10%				
Ftr	Internal labor costs (risk-adjusted)		$23,940	$223,881	$335,821	$423,821
Three-year total: $1,007,463			**Three-year present value: $823,430**			

Financial Summary

Consolidated Three-Year Risk-Adjusted Metrics



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($848,940)	($938,881)	($1,435,821)	($1,908,821)	($5,132,463)	($4,323,223)
Total benefits	$0	$2,302,200	$4,844,700	$6,577,200	$13,724,100	$11,038,341
Net benefits	($848,940)	$1,363,319	$3,408,879	$4,668,379	$8,591,637	$6,715,118
ROI						155%
Payback						8.0

APPENDIX A: TOTAL ECONOMIC IMPACT

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists solution providers in communicating their value proposition to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of business and technology initiatives to both senior management and other key stakeholders.

Total Economic Impact Approach

Benefits represent the value the solution delivers to the business. The TEI methodology places equal weight on the measure of benefits and costs, allowing for a full examination of the solution's effect on the entire organization.

Costs comprise all expenses necessary to deliver the proposed value, or benefits, of the solution. The methodology captures implementation and ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. The ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made unless other projects have higher NPVs.

RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

The initial investment column contains costs incurred at “time 0” or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

APPENDIX B: ENDNOTES

[1] Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists solution providers in communicating their value proposition to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of business and technology initiatives to both senior management and other key stakeholders.

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