Impacts of Komfort IQ Microzones & BERT Plug Load Controls on Energy Efficiency in Commercial Buildings

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Agenda & Presentation Objectives

Introduction to Emerging Technologies

ICF's Innovation and Pilot process.

Pilot Programs & Key Themes

Highlights from two ICF Pilots focused on low cost of entry and broad applicability of building types.

Operational Principles & Opportunities

Examination of how the technologies operate, improve energy efficiency and occupant comfort.

Scalable Deployment & Industry Alignment

Insight into scalable deployment potential and alignment with cost-effective, data-driven building optimization trends.

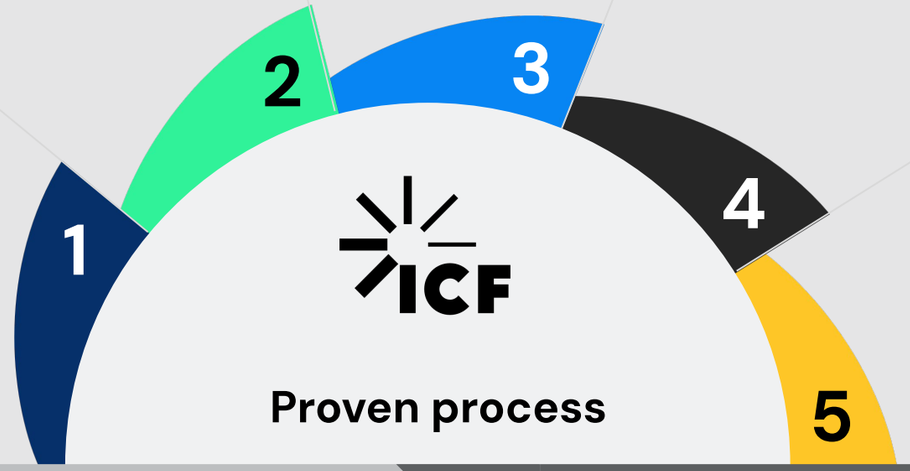
ICF's pilot development phases and workflow

Business case and research
ICF's business case process is aligned with our client's goals and supports continuous improvement for approvals and changes to residential and commercial programs.

Design and contract
ICF leverages our many subject matter experts and other stakeholders to support unique needs of each pilot. If a pilot requires it, ICF can do it.

Execute & Evaluate
ICF's Pilot teams deploy agile methodologies to execute and evaluate pilots. ICF can source M&V from within our own firm or through outside evaluation consultants, making execution and evaluation faster.

Ideation
Identification of pilot opportunities from ICF's repository and qualification according to client's strategic priorities.



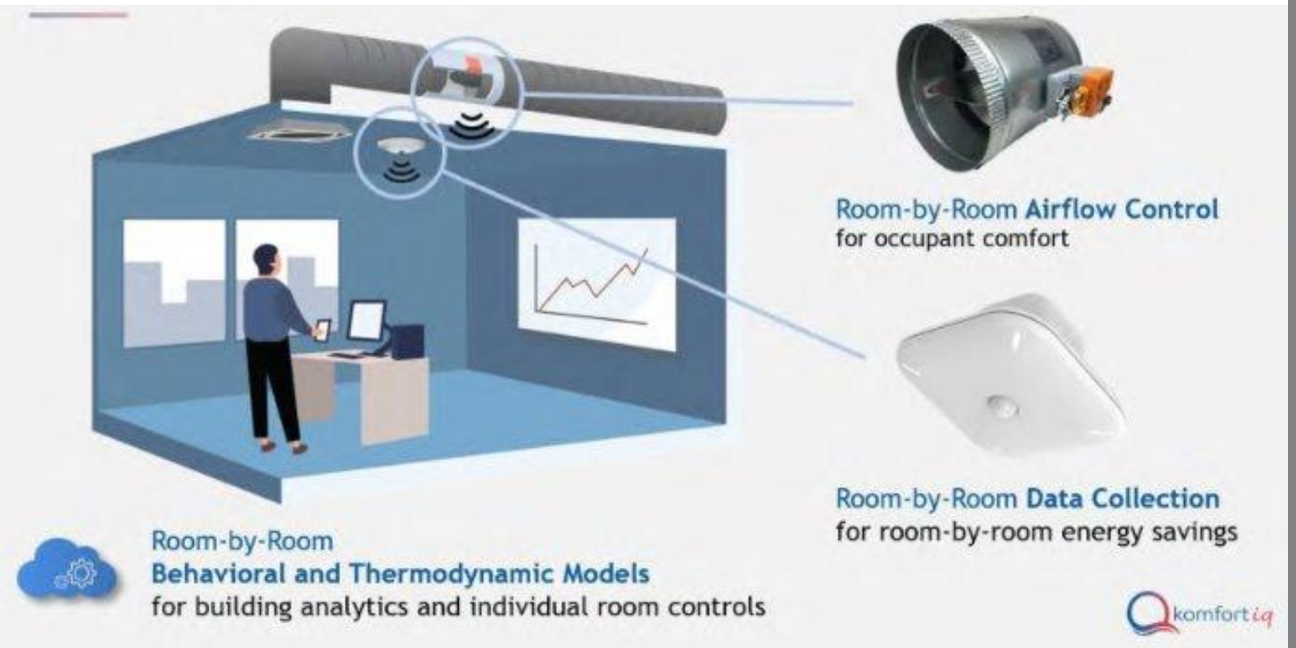
Conclusion and Recommendations
ICF provides recommendations for commercialization, or can assist in knowledge transfer, or develop pathways for integration into new or existing programs.

0 Concept valuation

6 Commercialization transition

Technology Overview

Komfort IQ Microzone Technology



Room-Level HVAC Control

Enables precise airflow and temperature control based on real-time occupancy data.

IoT and Sensor Integration

Measures temperature, CO2, light, and sound to dynamically adjust HVAC performance.

AI-Driven Efficiency

AI algorithms predict demand, optimize HVAC operation, reduce energy use, improve comfort.

Retrofit and Compatibility

Compatible with existing VAV and BMS systems, allowing retrofit without costly HVAC redesigns.

Savings Impacts

HVAC Energy use reduced by 30-50%

15-year measure life

BERT Plug Load Management

Centralized Real-Time Control

BERT devices enable centralized real-time management of plug-in and small hardwired loads in buildings.

Energy Savings Through Automation

Automated shutdowns during off-hours

- 10–18% reduction in whole-building energy consumption.
- Up to 50% savings per controlled device.
- $50–$200 annual savings per device.
- 15–25% reduction in peak demand charges.
- Significant CO_2 reductions (500–1,500 lbs per device annually).

Data Visibility and Integration

Provides granular energy usage data

Integrates with BAS platforms via BACnet and API protocols.

Scalable and Flexible Deployment

Suitable for offices, schools, and municipal facilities with easy installation and scalability.

ICF Pilot Highlights

Komfort IQ Microzone Technology

Pilot Implementation and Setup

The pilot retrofitted two mid-sized building HVAC systems with Komfort IQ actuators and sensors for operational testing.

Performance and Comfort Benefits

Improved temperature consistency and enhanced occupant satisfaction were observed during the pilot testing phases.

Operational Stability and Minimal Disruption

The pilot demonstrated stable HVAC operation with installations causing minimal disruption to building occupants.

Data-Driven Insights and Future Applications

Collected data guided future evaluations and indicated integration potential with utility energy efficiency programs.

BERT Plug Load Management Devices

Automated Plug Load Control

BERT pilot evaluated automated control to reduce energy use during unoccupied hours at participant sites.

Integration with Wi-Fi Networks

The system used Wi-Fi integration for centralized scheduling, monitoring, and data collection of device energy consumption.

Energy Usage Insights

Data collected provided baseline and after-hours usage patterns to inform future energy savings programs.

User Experience and Benefits

Participants reported easy installation and valued the system’s compatibility with existing building automation.

Key Themes/ Strategic Insights

Low Cost of Entry

Affordable HVAC Retrofit

Komfort IQ retrofits existing HVAC systems using motorized dampers and sensors, avoiding full replacements and reducing costs.

Wi-Fi Based Controls

BERT uses existing Wi-Fi networks to deploy smart plugs and inline controllers without complex wiring or construction.

Incremental Adoption

Both technologies support incremental deployment, enabling scaling from key zones or device groups over time.

Cost-Effective Utility Participation

Low-cost and simple solutions reduce barriers to utility program participation and align with budget priorities.

Broad Applicability Across Building Types

Versatile Integration

Komfort IQ integrates with various VAV and BMS setups, supporting offices, schools, and municipal buildings.

Retrofit and New Construction

Komfort IQ's retrofit design works with both existing and new building systems for flexible deployment.

Universal Plug Load Management

BERT manages plug loads effectively across offices, classrooms, and public-sector environments.

Comprehensive Energy Approach

Together, Komfort IQ and BERT address HVAC and plug load inefficiencies complementing other energy-saving measures for participants.

Use Cases/Market Relevance

Practical Applications and Industry Alignment

Higher Education Benefits

Komfort IQ manages variable occupancy in classrooms and offices, improving energy efficiency on campuses.

Corporate Hybrid Work Solutions

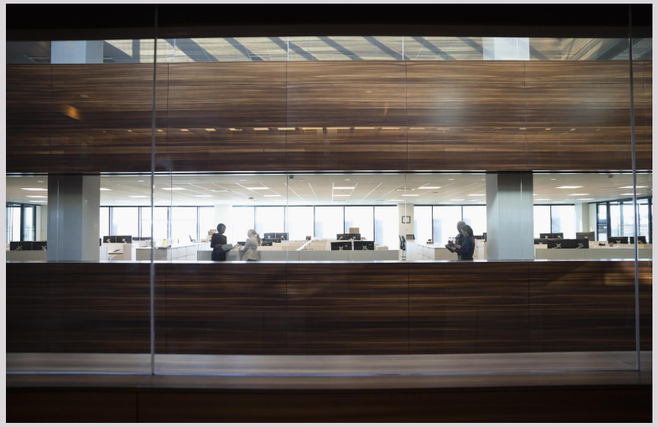
BERT reduces IT equipment energy waste, supporting hybrid work models in corporate offices.

Municipal and School Advantages

Low installation complexity and operational benefits make these solutions ideal for budget-conscious public buildings.

Utility Program Integration

Scalable technologies align with utility incentive programs and emerging technology portfolios for measurable impact.



Conclusion/Strategic Outlook

Key Takeaways and Future Considerations

Cost-Effective Energy Solutions

Komfort IQ and **BERT** provide scalable and affordable solutions that improve energy efficiency for commercial buildings.

Operational Viability

ICF ‘s Pilot projects demonstrate these technologies are aligned with utility goals and operate effectively in real environments.

Comprehensive Approach

Addressing HVAC and plug load inefficiencies reduces energy waste and enhances occupant comfort efficiently. They are a “NEXT BIG THING”

Strategic Industry Opportunity

These technologies offer stakeholders opportunities to expand programs and deliver impactful energy solutions.

Get in touch with us:

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