THE WHITE HOUSE
Office of the Press Secretary

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EXECUTIVE ORDER

PLANNING FOR FEDERAL SUSTAINABILITY IN THE NEXT DECADE

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to maintain Federal leadership in sustainability and greenhouse gas emission reductions, it is hereby ordered as follows:

Section 1. Policy. Executive departments and agencies (agencies) have been among our Nation’s leaders as the United States works to build a clean energy economy that will sustain our prosperity and the health of our people and our environment for generations to come. Federal leadership in energy, environmental water, fleets, buildings, and acquisition management will continue to drive national greenhouse gas reductions and support preparations for the impacts of climate change. Through a combination of more efficient Federal operations such as those outlined in this Executive Order (Order), we have the opportunity to reduce agency direct greenhouse gas emissions by at least 40 percent over the next decade while at the same time fostering innovation, reducing spending, and strengthening the communities in which our Federal facilities operate.

It therefore continues to be the policy of the United States that agencies shall increase efficiency and improve their environmental performance. Improved environmental performance will help us protect our planet for future generations and save taxpayer dollars through avoided energy costs and increased efficiency, while also making Federal facilities more resilience. To improve Federal performance and Federal sustainability, priority should first be placed on reducing energy use and cost, then on finding renewable or alternative energy solutions. Pursuing clean sources of energy will improve energy and water security, while ensuring that Federal facilities will continue to meet mission requirements and lead by example. Employing this strategy for the next decade calls for expanded and updated Federal environmental performance goals with a clear overarching objective of reducing greenhouse gas emissions across Federal operations and the Federal supply chain.

Sec. 2. Agency Greenhouse Gas Emission Reductions. In implementing the policy set forth in section 1 of this order, the heads of each agency shall, within 90 days of the date of this order, propose to the Chair of the Council on Environmental Quality (CEQ) and the Director of the Office of Management and Budget (OMB) percentage reduction targets for agency-wide reductions of scope 1 and 2 and scope 3 greenhouse gas emissions.
ABOUT MY COMPANY

- Formed in June 2015 around goals of Exec Order 13693
- Market Opportunity: 360,000 federally owned or operated buildings
- Square footage mix 87% of portfolio under 50,000 sq.ft.

- US Government Real Estate was first targeted niche
- Advocate Using Conservation as “First Fuel”
- Where Internet of Things intersects with Energy Efficiency
WORKING DEFINITIONS

Internet – Information Superhighway

- 1990 Tim Berners-Lee invents the World Wide Web
- August 1995 – MS Internet Explorer is released
- 27 years of development into applications
Internet of Things – Augmented Human Intelligence

- 1999 – presentation to Procter and Gamble first use of the term “IoT”
- Still new, raw, unpolished
- GE predicts Industrial IoT is $60 trillion market in next 15 years
Internet of Things Building

Sensor Front-End
- Lighting Control systems calibrated to employee wants and needs
  - Occupancy, light, temperature & power data
  - Optimization of lighting, HVAC and DR

Big Data Platform
- Big Data Systems to mine operational efficiencies
  - Data repository for buildings down to the square foot
  - Provides real estate optimization, asset tracking, safety and security applications
  - Available on-site, in private network or in the cloud

Distributed Sensing
- Lighting is Local
Mouse over any sensor to determine current light level, power, temperature and occupancy.
IoT Building – energy savings graph

- **Period Savings**: 64%
- **Current savings**: 60%
- **Load**
  - Current: 2.5 kW
  - Period Peak: 2.7 kW
  - Baseline: 4.2 kW

**Peak reduction**

*Graph showing energy usage for May 17, 2012, from 01:00 AM to May 18, 2012, 00:00 AM.*
IoT Building – big data extrapolation
IoT Building – occupancy map
Back to a typical building

• Design and installation circa 1990's.
• Inefficient 3-Lamp fluorescent troffer lighting
• There is no central Building Management System.
• Mechanical systems primarily include split systems and package units with some constant volume air handlers having stand alone VAV zone control.
• There is no connectivity or visibility into critical systems.
• Unable to centrally optimize temp set points, airflows, start / stop.
• Strain stemming from maintenance demands, service calls and comfort complaints.
• Reactive vs. predictive.
Typical Energy Consumption

Site Energy Usage

- Cooling: 38%
- Heating: 22%
- Lighting: 33%
- Domestic Hot Water: 1%
- Plug Load: 6%
Critical Path Activities

✔ Model the Opportunity and Create the Opportunity
✔ Perform site surveys and publish Efficient Enterprise reports
  – Prepare for Lighting / Lighting Control / Sensing / Connectivity upgrade projects.
  – Catalog all HVAC units.
    – Prioritize upgrade investments via predictive model.
  – Rank all in-scope buildings: ENERGY STAR and other relevant metrics
✔ Develop an open-source Smart Building specification with
  – Lighting
  – HVAC
  – Owner Control
  – IoT Connectivity

✔ SKILL SET: Excel, Statistics, Emotional Intelligence
Calculating the 1-100 ENERGY STAR score

- The 1 – 100 ENERGY STAR score
- The ENERGY STAR score allows everyone to quickly understand how a building is performing
- Eligibility for ENERGY STAR certification
- Assess your building’s performance
- Labeling
Efficient Enterprise Reports
Relevant Knowledge & Skills

✔ Excel models are the still norm
  – Unbelievably complex workbooks – Everyone has hires a guru

✔ Web Platforms and tablets are replacing Excel for
  – Energy audits
  – Cloud computing calculations for energy reductions, maintenance savings, rebates
  – Proposal generation

✔ Clients need browser access to a Dashboard
  – HTML 5
  – Owner Control

✔ IoT Connectivity
  – Cellular connections
  – Mesh networks
  – Secure, interoperable sensors and systems
Q&A