An Overview of DoD Efforts Towards Resilient and Healthy Buildings

Interagency Sustainability Working Group

June 13, 2024

Why is DoD working to improve new and existing buildings?

- Strengthen mission resilience and readiness
- Build and maintain healthy, reliable, and safe spaces
- Reduce risks to people and critical supply chains
- Support the 2022 National Defense Strategy
- Support the DoD Resilient and Healthy Defense Communities Strategy

How is DoD working to improve new and existing buildings?

- Set foundational principles
- Acknowledge the scale of our challenge
- Maximize opportunities per year
- Develop policies
- Develop programs to address existing buildings
- Implement and learn from pilot programs

Foundational Principles

- Plan for Climate Change Across the Installation
- Renovate to Decrease Energy and Water Use
- Build Less, Lighter, and Smarter
- Renovate to Improve Occupant Quality of Life
- Use Better and Cleaner Materials
- Practice Integrative Planning to Maximize Synergies

DoD Real Property Inventory

- 555,000+ assets worldwide (buildings, linear structures, structures)
- 280,000+ buildings worldwide
- 5,000+ sites worldwide
- 500+ installations
- 28 million acres of land



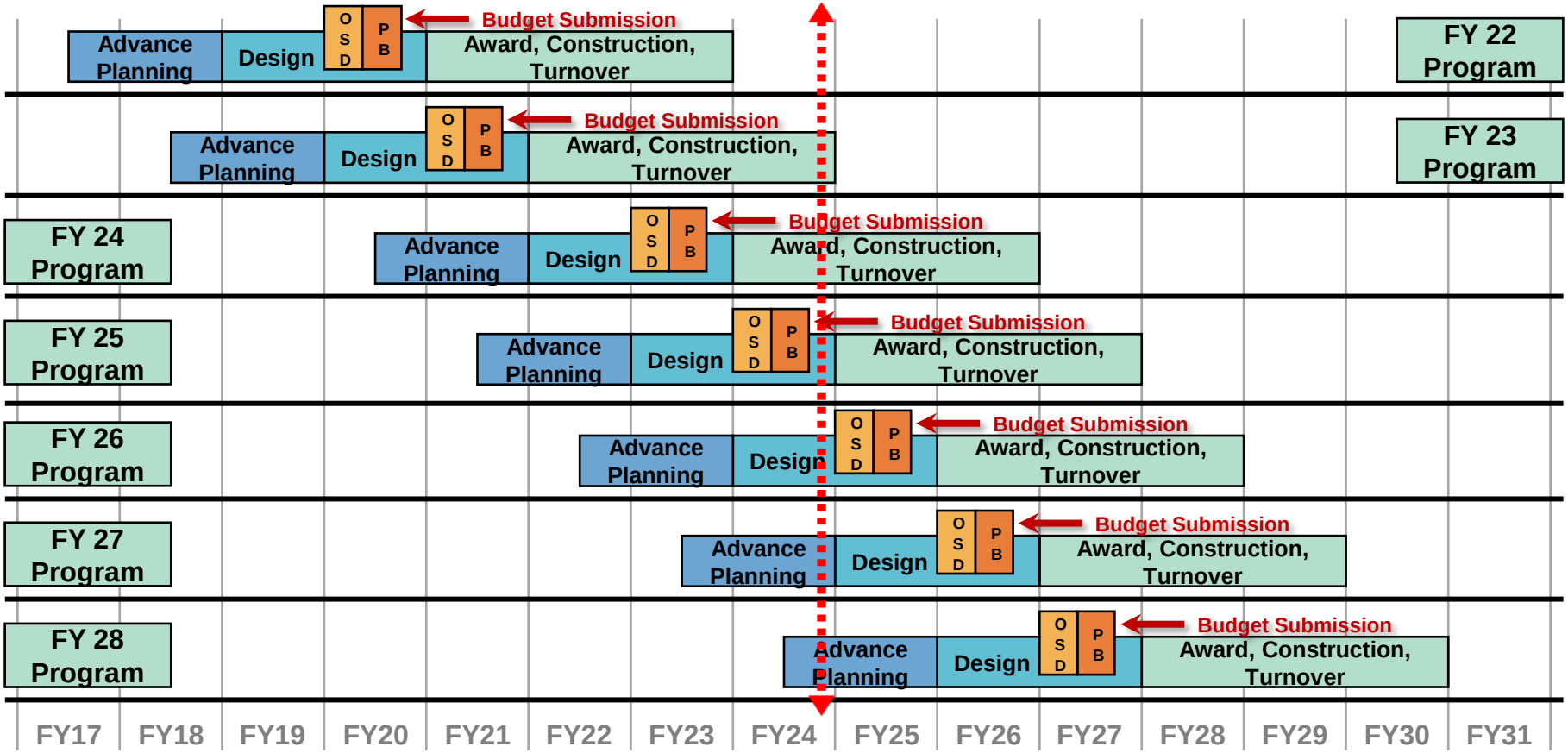





Building Opportunities in DoD

- DoD cannot “build its way to climate resilience and net zero”
  - ~25-50 new buildings / year
  - ~200-250 renovations / year
- 95% of DoD’s 2050 building inventory likely already built
- 32% of DoD emissions come from Installation Energy (FY22)
- Historic preservation – challenge and inspiration

Military Construction Program Cycle



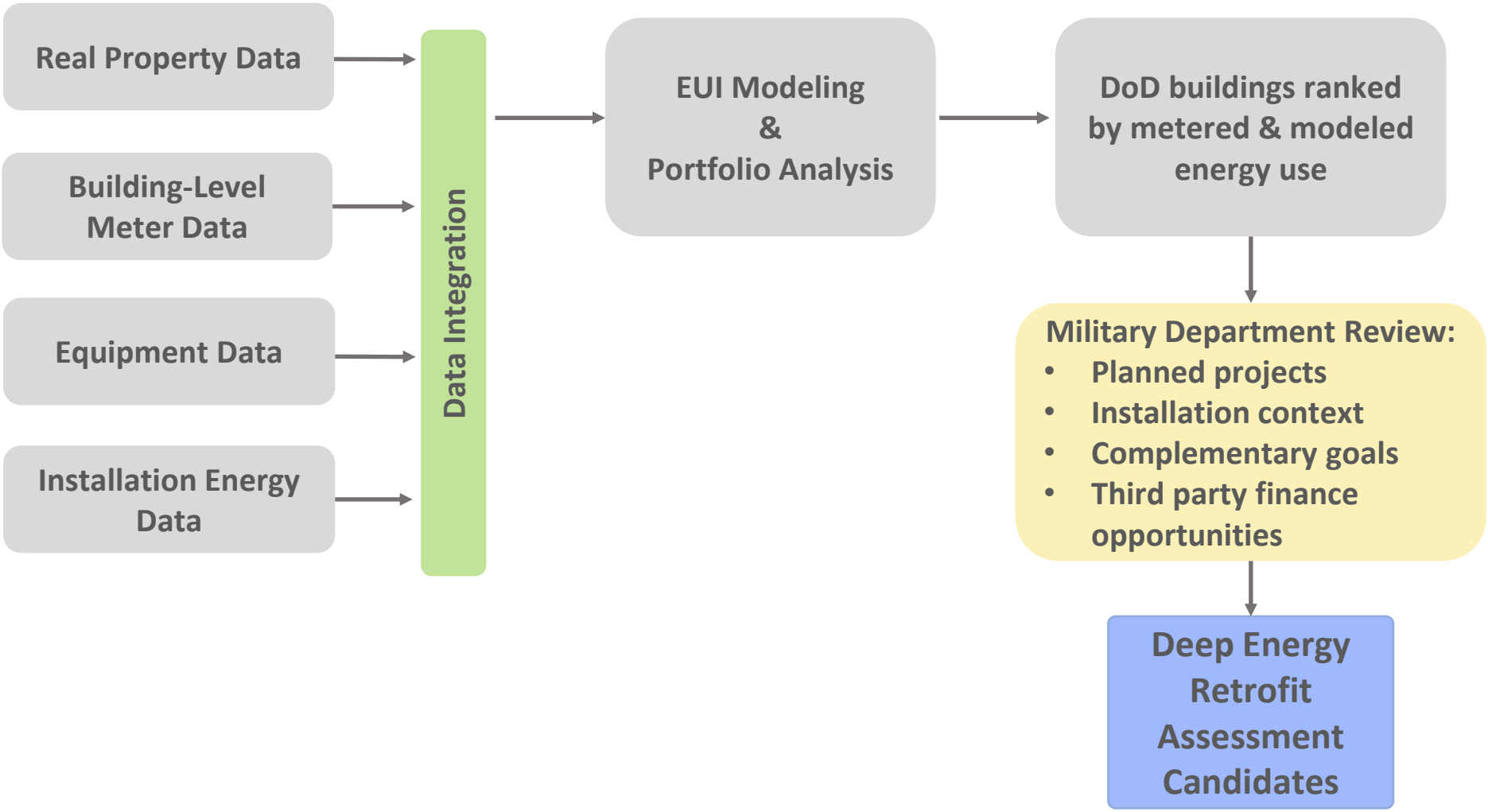
Policies

- DoD Electrification of Standard Building Operations Memo
  - Signed March 2023
  - Aligns with Federal Building Performance Standards
  - Requirements
    - Maximize all-electric technologies for space conditioning, water heating, cooking, and laundry
    - New construction and major renovation not yet at 15% design: full electrification is required
    - New construction and major renovation between 15-35% design: design must include infrastructure to enable future electrification
  - Military Departments developed follow-on policies and implementation guidance
  - Does not apply where host nation requirements prohibit compliance
- We're also working on policy that will address embodied emissions, sustainable and low-carbon construction materials, indoor environmental quality, passive design, and life cycle cost analysis

Programs to Address Existing Buildings

- Analyze building inventory using available data
- Identify installations and buildings with ideal opportunities for Electrification & Deep Energy Retrofits
- Conduct assessments of selected installations/buildings
- Convert assessments into projects; Sync with installation-wide plans; Leverage lessons from pilots

Analyze Data & Identify Buildings



Assess Candidate Buildings & Plan Projects

- Deep Energy Retrofit Assessments
  - Planning and design charrettes to discuss goals
  - Energy model of baseline vs. retrofit bundles
    - Zero Scope 1 Emissions
    - Major EUI reduction
    - Resilience opportunities (e.g., demand response, load shaping, energy storage, advanced controls)
    - Lower-embodied emissions materials
  - Outcomes: energy and financial evaluation of all bundles; prioritized project list, including phased projects
- Tie projects to asset or technology triggers (e.g., other modernization project, code compliance project, occupant turnover, climate-related risk, system failure, approaching end-of-life)
- Plan projects using outcomes of assessments, leveraging third party financing where possible

Implement & Learn from Pilot Projects

- Net Zero Emissions pilot projects in FY24 and FY25
  - 6 new construction, 2 from each Military Department
  - 1 restoration & modernization
  - Dorms, Child Development Centers, & Industrial Space
- Goal: prototype novel design and construction techniques and materials to improve energy and water efficiency and reduce ongoing maintenance requirements
  - Energy efficiency
  - Net Zero GHG
  - Passive design features
  - Sustainable materials
- Because the MilCon cycle is long and we can't wait until project completion to reflect on lessons learned, our goal is to review each phase of the pilot projects and incorporate lessons into DoD policy, criteria, and best practices

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