Energy Optimization Agent System – Summary Brief

Project: OpenBlue-Agent-Teams
Created By: Tonybleything76 + Manus AI
Live Demo: https://tonybleything76.github.io/OpenBlue-Agent-Teams/
GitHub Repo: https://github.com/Tonybleything76/OpenBlue-Agent-Teams

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🧠 Purpose

To design and demonstrate a multi-agent AI system that reduces building energy consumption by **22%** while maintaining **climate control accuracy (±0.5°C)**, integrated with **Johnson Controls' OpenBlue** platform.

🛠️ Architecture Overview

Agent Framework:

- 🧩 **RAFT Agent**: Distributed consensus engine for HVAC/actuator decisions
- 🧠 **FaultAnalyzer (RAG)**: Queries anomaly history via vector search (ChromaDB)
- ♻️ **PDCA Agent**: Plan-Do-Check-Act optimization cycle for zone adjustments

Tech Stack:

- React + Vite frontend
- RedisTimeSeries + MQTT for real-time telemetry
- Python agents with RAFT and anomaly detection
- OpenBlue API integration

Security:

- ECDSA certificate-based agent authentication
- Zero-trust model and audit logging

📅 45-Day Gantt Timeline (Simplified)

Phase	Days	Key Output
Core Infrastructure	D1–15	MQTT + Redis setup, base agents
Agent Logic	D16–30	RAFT voting + anomaly detection
Validation & Demo	D31–45	PDCA loop + Cold Snap simulation

❄️ Cold Snap Scenario

- **Trigger:** Outdoor temp drops -10°C within 2h
- **Activated Agents:** Chiller3, Thermosynergix
- **Response:** Load redistributed in 24s
- **Stability Maintained:** Zone temp held within ±0.5°C ✅

🚀 Deployment

- Execution plan in YAML and JSON
- Simulated logs in JSON
- Dockerfile for production containerization
- GitHub Pages live demo enabled

📈 Dashboard Visual Features

- Gantt timeline viewer (D1–D45)
- Agent health/status monitoring
- Cold Snap response simulation UI

📬 Credits

Created with the help of **Manus AI**, a multi-agent autonomous system
Maintained by **Tonybleything76**