EmiratesGBC Technical Workshops

by nhance

Indoor Environmental (Air) Quality & Energy Management

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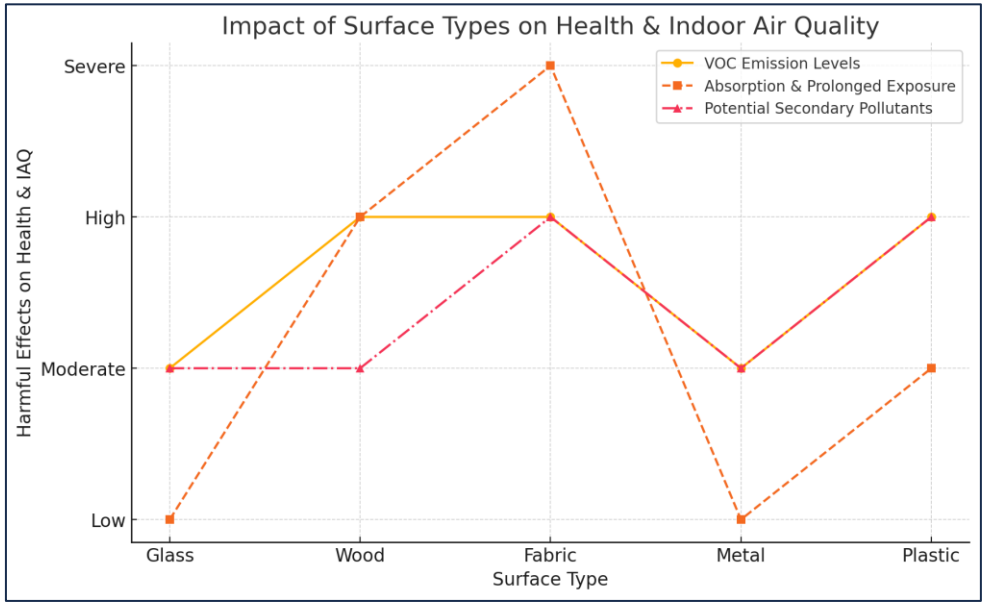
WHY INDOOR AIR QUALITY MATTERS?

- **Poor IAQ can lead to:**
  - Health issues (e.g., respiratory problems, fatigue, headaches)
  - Decreased cognitive function and productivity
  - Higher absenteeism and workplace dissatisfaction
- **Business impact:**
  - Increased healthcare costs
  - Lower operational efficiency
  - Potential regulatory non-compliance

KEY AIR QUALITY FACTORS

- **Ventilation** – Essential for fresh air; poor ventilation raises CO_2, causing fatigue and low focus.
- **Pollutants** – VOCs, dust, and mold from furniture, cleaning products, and HVAC systems impact health.
- **Humidity & Temperature** – High humidity promotes mold; extreme temperatures reduce productivity.
- **Cleaning Products & Surfaces**
  - Cleaning sprays release **VOCs**, causing respiratory issues.
  - **Porous surfaces (wood, fabric):** Absorb chemicals, prolonging exposure.
  - **Non-porous surfaces (glass, metal):** Allow quicker evaporation but still release fumes.
  - Some chemicals create **secondary pollutants** (e.g., formaldehyde, ozone).



MONITORING AIR QUALITY – TOOLS AND TECH

- **Sensors & Real-Time Monitoring**

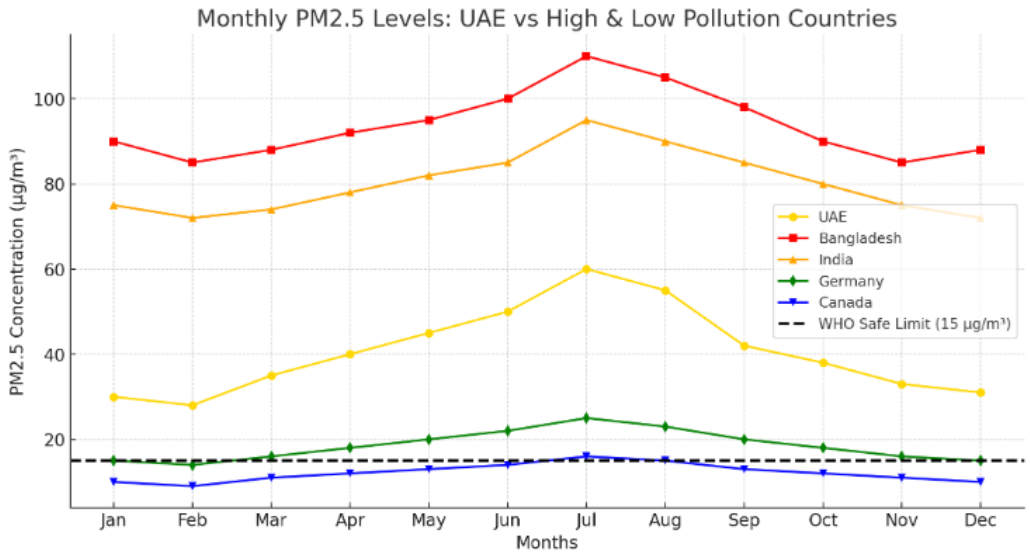
  CO_2, VOCs, humidity, temperature sensors

- **Integration with Building Management Systems (BMS)**

  Automated ventilation adjustments

- **Air Purification Systems**

  HEPA filters, UV-C treatment, activated carbon solutions, **air-purifying plants** or FRESH AIR from outside

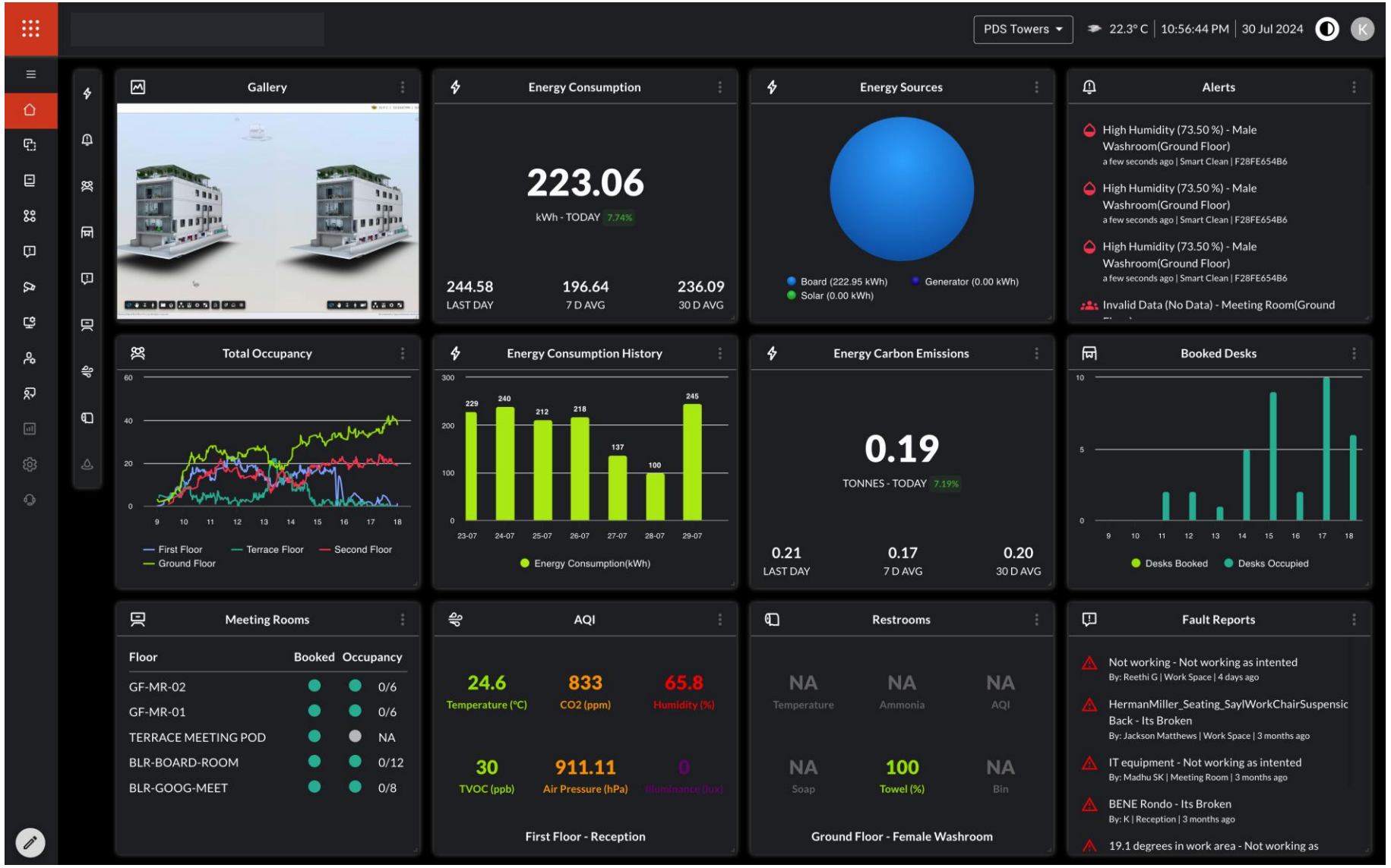


THE CONNECTION

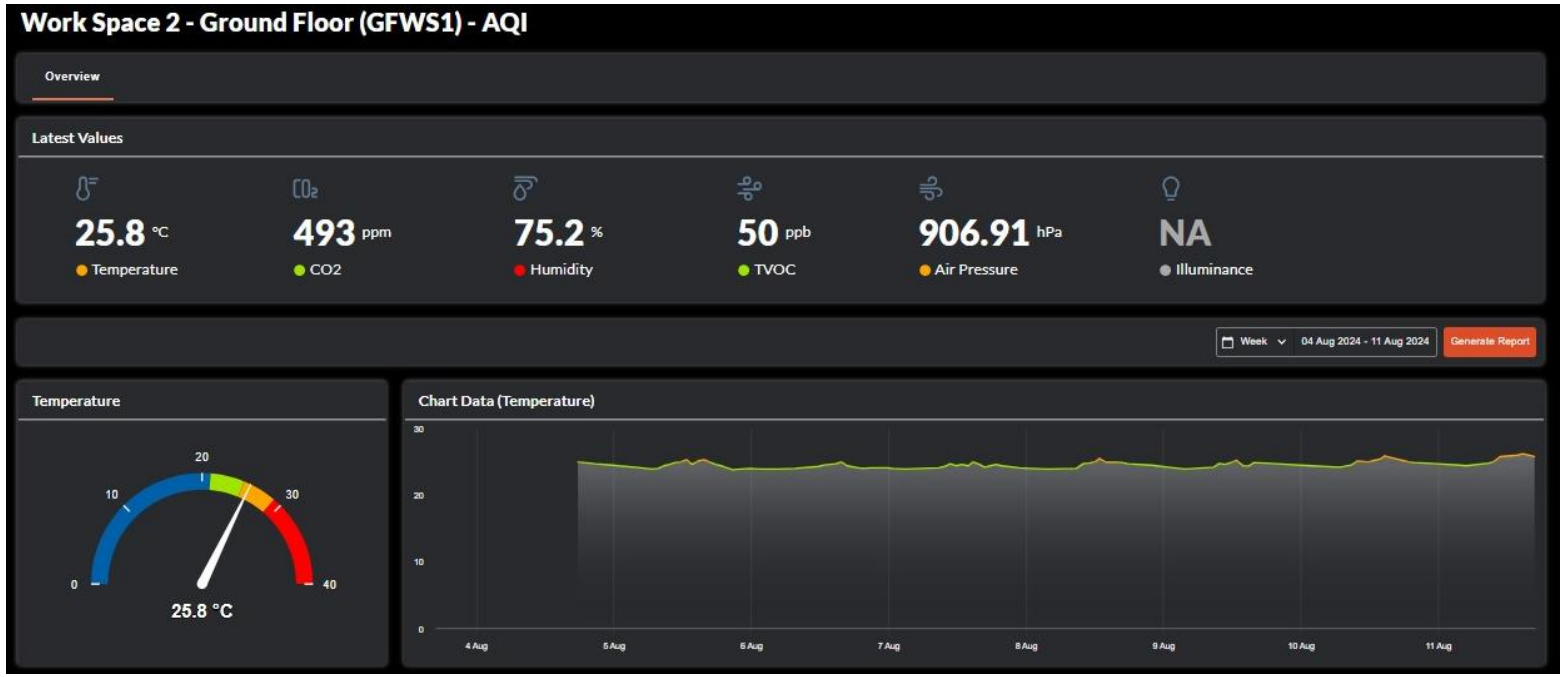
Smart IAQ = Energy Efficiency

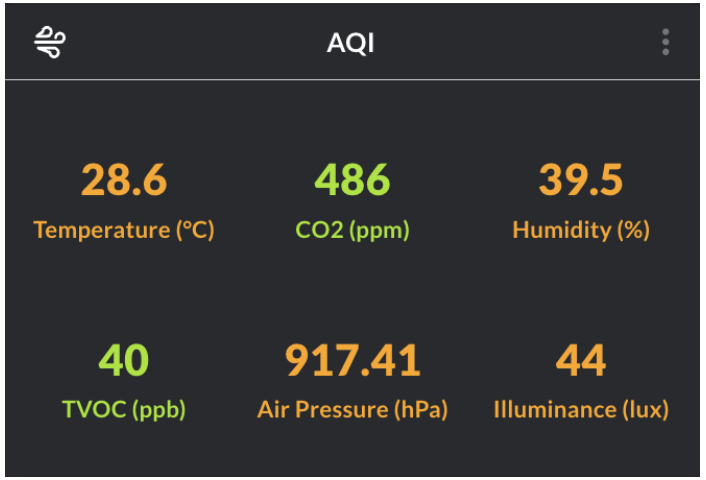
- HVAC Optimization: Efficient air circulation
- Demand-Controlled Ventilation (DCV): Adjusts airflow based on occupancy
- Energy-Efficient Purifiers: Clean air, low energy
- AI-Driven Analytics: Optimize energy use

NHANCE TWIN PLATFORM



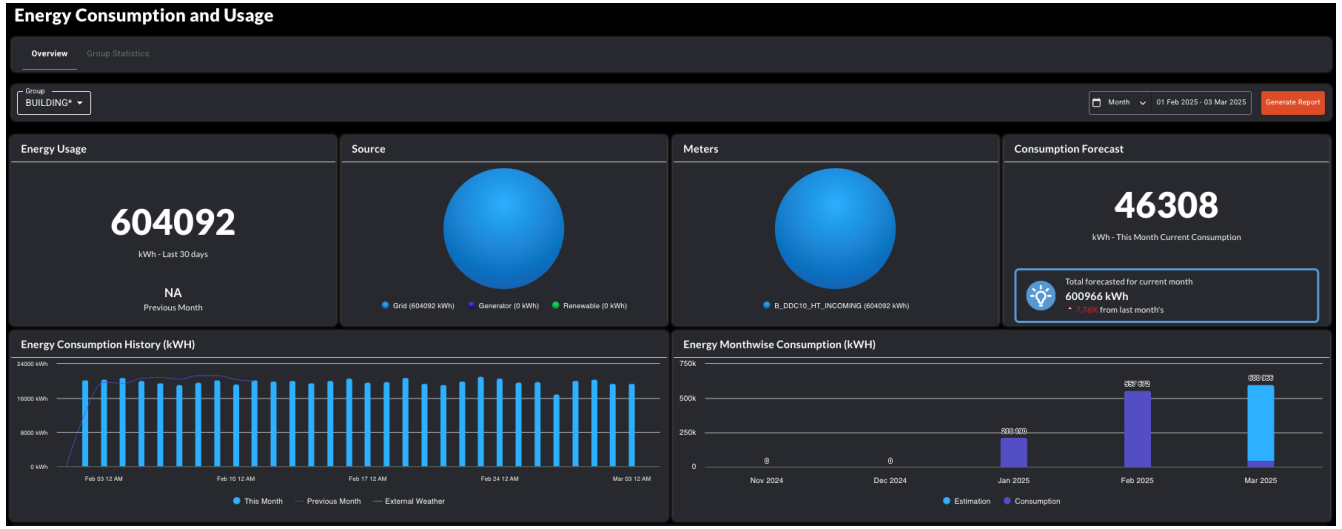
NHANCE TWIN PLATFORM – AIR QUALITY

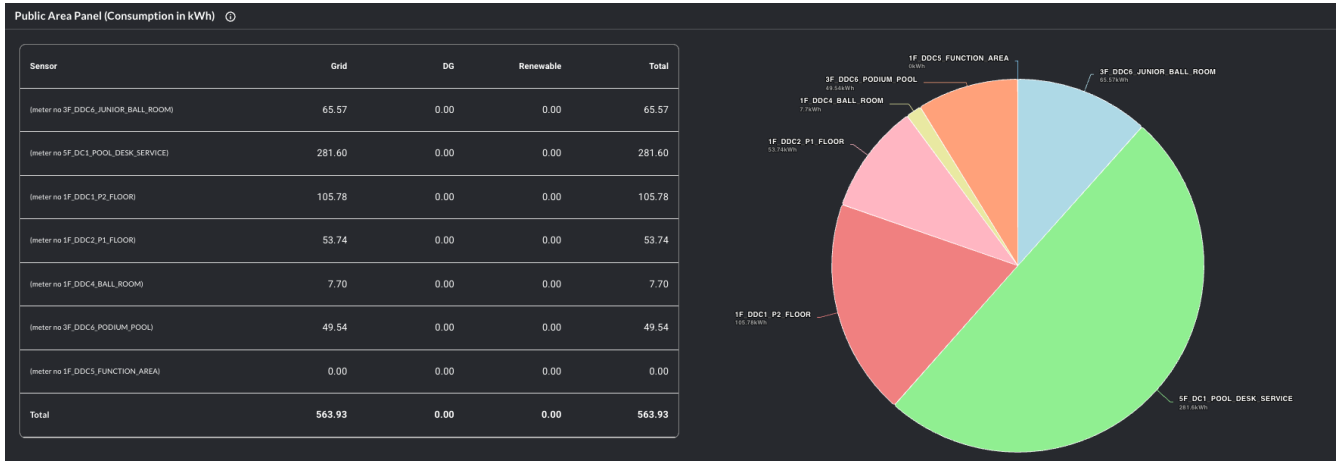




NHANCE TWIN PLATFORM - OCCUPANCY

NHANCE TWIN PLATFORM - ENERGY





Sensor	Grid	DG	Renewable	Total
(meter no 3F_DDC6_JUNIOR_BALL_ROOM)	65.57	0.00	0.00	65.57
(meter no 5F_DC1_POOL_DESK_SERVICE)	281.60	0.00	0.00	281.60
(meter no 1F_DDC1_P2_FLOOR)	105.78	0.00	0.00	105.78
(meter no 1F_DDC2_P1_FLOOR)	53.74	0.00	0.00	53.74
(meter no 1F_DDC4_BALL_ROOM)	7.70	0.00	0.00	7.70
(meter no 3F_DDC6_PODIUM_POOL)	49.54	0.00	0.00	49.54
(meter no 1F_DDC5_FUNCTION_AREA)	0.00	0.00	0.00	0.00
Total	**563.93**	**0.00**	**0.00**	**563.93**

CASE STUDY - IAQ & ENERGY SAVINGS IN ACTION

Hamar Municipality – by Airthings, Norway

- Energy Savings: 1,500 air quality monitors installed, reducing energy consumption by 2 million kWh between 2021 and 2022.
- Cost Savings: NOK 6 million saved, with a payback period of less than a year.

Commercial Real Estate building in India, by Nhance

- Energy savings of 20% by just monitoring the usage and switching off non essential loads in the first 60 days

ADNEC Case Study, UAE

- Energy Savings: 40% reduction in energy usage for HVAC systems by understanding space utilization.

Corporate HQ Implementation

- CO_2 sensor-driven ventilation reduced sick days by 30%.

SMART LIGHTING

Smart Lighting Management at DEWA Headquarters, Dubai

- DEWA implemented a s**mart lighting system** in their headquarters to optimize energy efficiency and reduce consumption.
- The system used **motion sensors, daylight harvesting, and occupancy detection** to adjust lighting automatically based on the building's real-time conditions.
- **Energy Savings:** The implementation led to a **50% reduction in energy consumption** for lighting, aligning with Dubai's ambitious sustainability goals.
- **Impact:** DEWA's smart lighting system not only **reduced energy costs** but also set a precedent for sustainable practices in Dubai's commercial sector.
- Key Features:
  - **Motion Sensors:** Automatically switch off lights when areas are unoccupied.
  - **Daylight Harvesting:** Adjusts artificial lighting to complement available natural light.
  - **Occupancy Detection:** Ensures lighting is only used when necessary, minimizing energy waste.

BEST PRACTICES FOR ORGANIZATIONS

- Regular IAQ assessments & sensor-based monitoring
- Implement smart ventilation and demand-controlled HVAC systems
- Use low-VOC materials and eco-friendly cleaning solutions
- Train employees on IAQ importance and workplace wellness

DISCUSSION & Q&A

- What IAQ challenges do you face in your workplace?
- How can IAQ improvements align with your company's sustainability goals?
- Are there specific air quality concerns unique to the UAE's climate?

SOURCES

- https://www.iqair.com/
- Air pollution – WHO
- Volatile Organic Compounds' Impact on Indoor Air Quality | US EPA
- VOCs in Cleaning Products | Indoor Air