**Criteria for the Decision Tree**

The criteria for evaluating indoor environmental quality are defined based on residential and classroom regulations from **EU member states**, **European standards**, and **global guidelines** such as those from the **World Health Organization (WHO)** and **Environmental Protection Agency (EPA)**.

**1. CO₂ Concentration** [ANALYSIS OF RESIDENTIAL BUILDING REGULATIONS IN EIGHT EU MEMBER STATES]

* **Threshold:** ≤ 1,000 ppm
* **Justification:** France's residential building regulations specify that indoor CO₂ concentration should not exceed 1,000 ppm to ensure sufficient ventilation and prevent drowsiness and discomfort. Lower levels indicate better air exchange and occupant comfort.

**2. Temperature** [ANALYSIS OF RESIDENTIAL BUILDING REGULATIONS IN EIGHT EU MEMBER STATES]

* **Threshold:** 19°C to 28°C
* **Justification:** French building regulations recommend maintaining this temperature range for thermal comfort.

**3. Humidity** [ANALYSIS OF RESIDENTIAL BUILDING REGULATIONS IN EIGHT EU MEMBER STATES]

* **Threshold:** 30% to 70%
* **Justification:** Germany’s guidelines specify this range to avoid issues like mold growth (high humidity) or respiratory discomfort (low humidity). Maintaining this range supports a healthy environment.

**4. Volatile Organic Compounds (VOCs)** [ANALYSIS OF RESIDENTIAL BUILDING REGULATIONS IN EIGHT EU MEMBER STATES] [WHO]

* **Threshold:**
  + General population: ≤ 100 μg/m³ for 30 minutes.
  + Sensitive individuals: ≤ 10 mg/m³.
  + WHO guideline: 0–400 ppb (parts per billion).
* **Justification:** Brussels' regulations provide specific thresholds to avoid irritation or adverse health effects from VOCs. WHO guidelines also emphasize the importance of low VOC levels for improved indoor air quality.

**5. Particulate Matter (PM2.5 and PM10)** [FRAMEWORK FOR HEALTH-BASED VENTILATION GUIDELINES IN EUROPE]

* **Thresholds:**
  + PM10: ≤ 50 μg/m³ (24-hour average).
  + PM2.5: ≤ 25 μg/m³ (24-hour average).
* **Justification:** European standards for indoor air quality limit PM concentrations to these values. High levels of PM10 and PM2.5 are associated with respiratory issues and reduced indoor air quality, especially in sensitive populations.

**6. Noise Levels** [EPA (ENVIRONMENTAL PROTECTION AGENCY)]

* **Thresholds:**
  + Classrooms: ≤ 35 dB for teaching and learning.
  + General indoor spaces: ≤ 45 dB to avoid annoyance and interference with activities (EPA).
* **Justification:** EPA guidelines specify these noise levels to ensure a quiet and productive environment, especially in classrooms where high noise levels hinder learning.