

## Indoor Air Quality Regulation in California Title 24 Standards

### Energy Commission Authority and Responsibility

Throughout the 1980s, the California state legislature became aware of growing numbers of complaints about “sick building syndrome” and “tight building syndrome.” Reports and news articles relied on by the legislature<sup>1</sup> in enacting laws intended to safeguard indoor air quality discussed a variety of hazards to public health and safety ranging from mild symptoms such as becoming ill, experiencing nose, throat, and eye irritation, to severe chronic effects including carcinogenicity, neurotoxicity, mutagenicity, and reproductive effects.

In response, the state legislature in 1982 enacted statutes empowering the Department of Health Services<sup>2</sup> to study indoor air quality and establishing an Indoor Air Quality Program to study these issues. Subsequent reports and briefing papers prepared by the California State Legislature, the California Energy Commission, and the California Air Resources Board in 1987,<sup>3</sup> 1988,<sup>4</sup> 1994,<sup>5</sup> 2005,<sup>6</sup> and 2009<sup>7</sup> identified a wide range of indoor air pollutants, including (but not limited to<sup>8</sup>) asbestos, many forms of biological agents, carbon monoxide, endocrine disruptors, tobacco smoke, formaldehyde and other aldehydes, lead, nitrogen dioxide, wide arrays of organic chemicals, ozone, particulate matter, pesticides, polycyclic aromatic hydrocarbons, radon, traditional criteria pollutants, and others. The Air Resources Board concluded in 2005<sup>9</sup> that the impact of *indoor* air pollutants on public health and safety was several orders of magnitude greater than *outdoor* air pollutants, and causally related to asthma, cancer, many forms of irritation, sick building syndrome, respiratory disease, work loss and reduced productivity, lung damage, breathing difficulties, nausea, tremors, drowsiness, dizziness, impacts to neurodevelopmental outcomes in unborn children (various VOCs), dermal allergic sensitization (formaldehyde), headaches, death (in the case of some indoor combustion products), and significantly increased impacts to sensitive groups, including children, the elderly, and those with chemical sensitivities. Biological contaminants, including mold, fungi, bacteria, and viruses, may also lead to a wide array of symptoms and diseases with impacts ranging from mild to severe. Many of these indoor air pollutants also increase the risk of premature death, and according to the Air Resources Board, are particularly problematic for sensitive populations, including children and the elderly, those predisposed to asthma and other respiratory diseases, and those with chemical sensitivities.

In addition to the significant risks associated with inadequate indoor air quality, many of these reports also acknowledged the regulatory challenges inherent in addressing this complex problem. Neither federal agencies (U.S. Environmental Protection Agency, U.S. Department of Energy) nor most relevant state agencies (California Air Resources Board, California Department of Public Health, formerly Department of Health Services, California Department of Industrial Relations/CalOSHA) were authorized to enact general (non-industrial) air quality standards.<sup>10</sup> While increased ventilation, source removal and control, air cleaning and purification, and behavioral adjustments are all important components of reducing the risks and health hazards of inadequate indoor air quality, reports before the legislature during the 1980s acknowledged that regulatory authority and capacity in these areas was limited. By contrast, building standards were presented as a “well established” regulatory pathway.<sup>11</sup>

In light of these concerns and findings, the California state legislature enacted laws intended to safeguard the public interest by protecting and enhancing indoor air quality.

Passed in 1988, Public Resource Code 25402.8 not only authorized but mandated the Energy Commission, when assessing new building standards, to consider the impacts that those standards would have on indoor air quality. Furthermore, when enacting building standards, the Energy Commission is required by law under Public Resources Code Section 25402(b)(3) and Health and Safety Code 18930 to promulgate standards that are consistent with public health and safety statutes and regulations. In 1995, the California legislature further enacted Health and Safety Code Sections 105400 and 105410. Here, according to Health and Safety Code Section 105400:

“The Legislature finds and declares that:

(a) The people of the State of California have a primary interest in the quality of the indoor environment in which they live.

(b) As people spend greater portions of time each day indoors, the environmental quality of our buildings becomes increasingly important.

(c) Changes in building design, materials, construction, and operation have resulted in significant changes in indoor environmental quality.

(d) Activities and use of chemical products, appliances, power equipment, wear and tear of structural decorative materials, thermal factors, and mechanical ventilation are degrading the indoor environment, thereby creating mounting dangers to the public health, safety, and welfare.”

According to Health and Safety Code Section 105410:

“The Legislature, in view of the findings and declarations specified in Section 105400, declares that the public interest shall be safeguarded by a coordinated, coherent state effort to protect and enhance the indoor environmental quality in residences, public buildings, and offices in the state.”

Throughout this time, Air Resources Board reports have consistently recognized the Energy Commission’s authority to promulgate building energy efficiency standards that address indoor air quality as a key tool in California’s efforts to improve indoor air quality.<sup>12</sup>

Based on the history of indoor air quality issues in California, the Energy Commission has consistently considered the impacts our building standards have on indoor air quality, and have promulgated new building standards that protect and enhance indoor air quality, consistent with public health and safety statutes.

In the 2008 Building Code cycle, the Energy Commission continued these efforts to comply with statutory requirements to protect and enhance indoor air quality by requiring more stringent ventilation standards, consistent with the Energy Commission’s statutory mandates, including adopting by reference with amendments, ASHRAE Standard 62.2-2007.

In the 2013 and 2016 Building Code cycles, the Energy Commission continued these efforts by introducing changes intended to make additional improvements to indoor air quality, and began requiring HERS verification of ventilation airflow, adopting by reference with amendments, ANSI/ASHRAE Standard 62.2-2010, including ANSI/ASHRAE Addenda (b), (c), (e), (g), (h), (i), (j), (l), and (n).

For the upcoming 2019 Building Code cycle, the Energy Commission is considering further steps, including adopting by reference with amendments, ANSI/ASHRAE Standard 62.2-2016 and ANSI/ASHRAE Standard 62.1-2016.

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<sup>1</sup> AB 4655 (Tanner 1988) legislative history, including committee files, author's bill files, and references to numerous agency reports and select newspaper articles introduced in committee hearings.

<sup>2</sup> Currently, the Department of Public Health.

<sup>3</sup> Jenkins, Mui, and Philips et al., California Air Resources Board, "Indoor Air Quality/Personal Exposure Presentation Briefing Paper", May 1987.

<sup>4</sup> Tanner, Background Paper, California State Assembly Committee on Environmental Safety and Toxic Materials, Informational Hearing on Indoor Air Quality, February 22, 1988; see pp. 1-12.

<sup>5</sup> California Energy Commission, "California's Energy Efficiency Standards and Indoor Air Quality", P400-94-003, December 1994.

<sup>6</sup> California Air Resources Board, "Report to the California Legislature: Indoor Air Pollution in California", submitted pursuant to Health and Safety Code §39930 (AB 1173, Keenly 2002), available online at <https://www.arb.ca.gov/research/indoor/ab1173/finalreport.htm>

<sup>7</sup> PIER Collaborative Report, California Energy Commission and California Air Resources Board, "Ventilation and Indoor Air Quality In New Homes", CEC-500-2009-085, November 2009, available online at <https://www.arb.ca.gov/research/apr/past/04-310.pdf>

<sup>8</sup> Summarizing, in part, the public health and safety risks described in detail at pp. 1-180 in the Air Resources Board's 2005 Report to the Legislature.

<sup>9</sup> *Ibid.*

<sup>10</sup> See 1988 Background Paper at pp. 8-12 (Government Role in Indoor Air Quality), legislative history materials to AB 4655; see also 1987 ARB Background Paper at ii (executive summary) and 47-57 (Activities Of Other Agencies In Indoor Air Quality; State Agencies; Federal Agencies) (noting state agencies have limited authority over indoor air quality issues related to their primary missions); July 2005 Air Resources Board report at pp. 151-152 (Energy Commission's broad role in setting building standards under Title 24; ventilation standards), pp. 167-168 (Energy Commission involvement in interagency efforts to study indoor air quality), p. 175 (Energy Commission authority to address indoor air quality in energy efficient buildings), and p. 190 (same); November 2009 Joint CEC-ARB ventilation report at pp. 215-218 (recommended changes to Title 24 standards under Energy Commission authority implemented to address indoor air quality issues in the 2008 code cycle).

<sup>11</sup> See California State Legislature 1987 Air Resources Board Background Paper at p. ii ("A number of other state agencies have limited authority over various aspects of indoor air quality specifically related to their primary mission. From the information available, it appears that regulatory control over building standards is well established in the state but that authority over [list of alternative solutions] is limited." See also 1988 Background Paper, pp. 6-8 (Remedies—Control Methods) and pp. 8-12 (Government Role in Indoor Air Quality).

<sup>12</sup> See, e.g., Air Resources Board 2005 report at p. 182 ("Amend building codes to address indoor air quality").