Chief Executive Office.

COUNTY OF LOS ANGELES
Kenneth Hahn Hall of Administration
500 West Temple Street, Room 713, Los Angeles, CA 90012
(213) 974-1101 ceo.lacounty.gov

CHIEF EXECUTIVE OFFICER
Fesia A. Davenport

July 22, 2025

To: Supervisor Kathryn Barger, Chair
Supervisor Hilda L. Solis
Supervisor Holly J. Mitchell
Supervisor Lindsey P. Horvath
Supervisor Janice Hahn

From: Fesia A. Davenport
Chief Executive Officer

REPORT BACK ON ENSURING EQUITABLE DISTRIBUTION OF CLIMATE EQUITY FUNDS (ITEM NOS. 50 AND 66, AGENDA OF NOVEMBER 6, 2024)

On November 6, 2024, the Board of Supervisors (Board) adopted a motion directing the Chief Executive Officer, in consultation with the Anti-Racism, Diversity, and Inclusion (ARDI) Initiative, the Chief Sustainability Office (CSO), and the Department of Public Works (DPW), to report back with recommendations to adopt: a) a formula for the equitable distribution amongst the five Supervisorial Districts of the $5.0 million exception fee anticipated to be deposited by the Southern California Gas Company (SCG) into a new Los Angeles County (County) Climate Equity Account (CEA); b) eligibility criteria and guidelines for use of the funds deposited into the new CEA; and c) the process and procedures to be used by each Supervisorial District to allocate their respective district share of the funds from the new CEA for eligible program(s) and/or projects(s), including Board-directed projects or programs of countywide significance.

Background

The Board approved a Resolution of Intention to grant SCG a countywide gas pipeline franchise for an initial term of ten years, with an option for a renewal term of up to ten years, resulting in a total possible term of 20 years. SCG will pay the County an initial granting fee of $10,000 and a $5.0 million fee for a 5-year term limit exception, to be paid within 30 days of the ordinance adoption. The $5.0 million exception fee will be allocated into the CEA, intended to support climate mitigation, adaptation, and decarbonization efforts. Notably, similar agreements have been established between SCG and the cities of Los Angeles and San Diego. Additionally, SCG is working toward its ASPIRE 2045 objectives, which include achieving net zero greenhouse gas emissions in both its operations and energy

delivery by 2045. The franchise aligns with SCG's 2045 decarbonization goals, which are consistent with both the State's and the County's Climate Action Plan.

Distribution Formula

Natural gas continues to be a major contributor to both climate change, morbidity, and mortality in communities of concentrated disadvantage. To offer effective interventions against these threats, the ARDI Initiative recommends distribution of the SCG exception fee in communities based on the pipeline mileage and expended in areas where the greatest exposure to indoor air pollutants and vulnerability exists from the toxic emissions of natural gas. Using pipeline mileage enables us to track the likelihood of new development and the risk of exposure to natural gas in communities and allocate funds across the five Supervisorial Districts by the overall percentage of natural gas pipelines in unincorporated areas within each District.

LA County Supervisorial District	Pipeline Mileage	Pipeline Milage %	$5M Allocation
1 - Solis	926.06	31.4%	$1,568,073
2 - Mitchell	595.25	20.2%	$1,007,921
3 - Horvath	59.04	2.0%	$99,971
4 - Hahn	325.58	11.0%	$551,296
5 - Barger	1,046.93	35.5%	$1,772,739
TOTAL	2,952.86	100.0%	$5,000,000

Data provided by SoCalGas from most recent franchise statement (March/April 2024).

The Attachment provides an overview of the hazards posed by the production and usage of natural gas and recommendations to ensure that equity-centered investments reach the households and communities most sensitive to benzene, carbon monoxide, nitrogen dioxide and other toxic exposures produced by natural gas. Sensitivity to indoor air quality is analyzed through four determinants: population sensitivity, outdoor air quality, socioeconomic status, and housing characteristics.

Criteria and Guidelines

In line with the intention of the CEA to support climate mitigation, adaptation, or decarbonization, the Chief Executive Office (CEO) recommends that the following criteria be applied to evaluate any proposed expenditures of CEA funds.

Proposed projects must provide a local climate resilience benefit in a climate vulnerable community. The expenditure must improve climate resilience for one of the climate hazards identified in the County Climate Vulnerability Assessment (CVA):

- The benefit must accrue locally to a community-identified need based on criteria in the CVA and once finalized, the Indoor Air Quality Sensitivity (IAQS) Index.
- Improving climate resilience can include outcomes such as reducing exposure to climate hazards; mitigating climate emissions while providing community benefits; implementing nature-based solutions; and/or protecting, conserving, and restoring natural resources.[1] Examples of specific strategies to "improve climate resilience" include, but are not limited to, the following:
    - Installation of indoor cooling, heating, and energy efficiency appliances and measures;
    - Residential ventilation retrofits, clean energy rebates, and other mitigations to improve the health of vulnerable populations through the reduction of household contaminants;
    - Education and outreach to residents about climate and indoor health hazards;
    - Increasing green space and tree canopy, including removal of pavement;
    - Building decarbonization; and
    - Demonstrate alignment with the OurCounty Sustainability Plan goals, strategies, or actions in the OurCounty plan, and at a minimum should not conflict with the Plan.

Proposed projects should NOT:

- Increase reliance on fossil fuels.
- Include or require purchase of or investment in new fossil fuel equipment, appliances, or infrastructure.

Projects meeting the above criteria can encompass a wide array of efforts and applications. The County has several programs and projects that are either current or in development that could similarly fit the above criteria and are detailed in the Attachment.

Process and Procedures

Departments will submit proposed projects, including Board-directed projects or programs of countywide significance, directly to CSO. The CSO, with the support of ARDI, will review the proposals and develop a recommended spending plan based on the criteria and guideline outlined in this report. Both departments will then present a comprehensive funding plan to the Board for approval.

---

[1] https://resilient.mass.gov/rmat_home/designstandards/

As part of the process, CSO and ARDI will coordinate efforts and provide additional guidance to support departmental project proposals. If the request is for community-based organization (CBO) funding, a County department will be contracting with the CBO. Departmental oversight is required to establish administrative infrastructure, including claiming, auditing, and project compliance. This approach will enhance collaboration and ensure alignment with the equitable distribution of funds to support climate resilience.

Recommendation

Unless otherwise directed by the Board, within 30 days of the date of this memorandum, the formula distribution methodology, eligibility criteria and guidelines, and the processes and procedures for allocating funding from the newly established CEA for eligible program(s) and/or project(s) shall become effective. These elements will serve as the official framework for all future funding allocations.

Summary

Climate and health hazards created by the usage of natural gas are growing concerns in the public health and scientific communities. Through the development of the IAQS Index, the County can provide a unique and replicable mapping instrument to accurately identify communities and households at the census tract level that are most vulnerable to indoor natural gas emissions and inform the many current coalition and government-led home health programs addressing indoor air quality and/or decarbonization. Leveraging existing home inspection and decarbonization programs can furthermore provide efficient and cost-effective methods to invest CEA funds that improve public health and build a more resilient County.

Should you have any questions, please contact me or Rene Phillips at (213) 974-1478 or rphillips@ceo.lacounty.gov. For ARDI specific questions, please contact Dr. D'Artagnan Scorza at dscorza@ceo.lacounty.gov and for CSO specific questions, contact Rita Kampalath at rkampalath@cso.lacounty.gov.

FAD:JMN:MM:CDM
DS:BR:CS:RP:AB:kn

Attachment

c: Executive Office, Board of Supervisors
County Counsel
Public Works

CLIMATE EQUITY ACCOUNT FUNDS

Background

The continued usage of natural gas as an energy source for residential and commercial buildings, while a short-term necessity, carries numerous climate and public health hazards. Methane, the primary component of natural gas, is a leading source of global warming that agencies, including the Environmental Protect Agency (EPA), have historically underestimated in terms of its potency and overall emissions. Public agencies, research institutions, and policymakers have responded to growing medical, scientific, and community concerns by accelerating efforts to phase out natural gas at the federal, State, regional, and local level.

Supply-Side Natural Gas Phase Out Policies

In 2023, the EPA released a ruling to curb the release of methane from oil and natural gas operations, with a goal of reducing emissions to 80% of the current levels by 2038.[1] The Federal Sustainability Plan sets a goal to achieve net-zero emissions procurement by 2050.[2] The California Public Utilities Commission (CPUC) has several natural gas supply-side policies including making California the first state to eliminate natural gas subsidies, and a comprehensive review of utility natural gas infrastructure to support the transition away from natural gas.[3] Locally, the County of Los Angeles and the City of Los Angeles are collaborating and jointly incorporated goals to phase out oil and gas operations in their respective 2019 sustainability plans.[4]

In September 2024, California Governor Newsom approved Senate Bill 1221, the Neighborhood Decarbonization Act, to redirect funding for natural gas infrastructure to zero-emission alternatives. With this bill, California joins a growing list of states that are closing the chapter on gas pipeline investment and setting out toward a clean and affordable energy future.[5]

Demand-Side Natural Gas Phase Out Policies

California is a national leader in the transition to all-electric homes including 2022 building standards set by the California Energy Commission to encourage fossil-fuel free alternatives to natural gas,[6] and requirements for new home construction, such as South Coast Air Quality Management District's (SCAQMD) 2024 rule to require new and existing buildings to transition to zero-emission residential and commercial building water heaters.[7]

---

[1] US Environmental Protection Agency. Key Things to Know About EPA's Final Rule to Reduce Methane and Other Pollution from Oil and Natural Gas Operations Fact Sheet.
[2] US Office of the Federal Chief Sustainability Officer. Federal Sustainability Plan.
[3] California Public Utilities Commission. CPUC Creates New Framework to Advance California's Transition Away From Natural Gas.

[4] Los Angeles County. Los Angeles County and Mayor Eric Garcetti Announce Results of First-Ever Transition Strategy for Oil Extraction Workers.
[5] Natural Resource Defense Council. CA Legislature Passes Major Clean Buildings Win.
[6] California Energy Commission. 2022 Building Efficiency Standards.
[7] SCAQMD Rule 1146.2.

The City of Berkeley (2019) and the City of Los Angeles (2022) each passed ordinances banning gas pipelines in new home construction. Although legal challenges have stopped the enforcement of the ordinance in Berkeley and threaten implementation in Los Angeles, they have played an important role accelerating the conversion to all-electric homes. Over 70 other California cities have adopted ordinances either prohibiting or discouraging new gas pipelines for newly constructed buildings.[8]

However, as the movement toward cleaner residential energy sources progresses, the need to accelerate an all-electric transition in low-income communities becomes more urgent to avoid passing on soaring natural gas rates to less affluent communities. Because a reduction in gas customers will not result in fewer pipelines to maintain, the cost per household will soar and through adverse selection, those who cannot afford to transition to all electric homes will be the ones left to endure those increased costs. Research has corroborated this burden disproportionately effecting low-income and Black populations when utility customer bases shrink.[9]

Natural Gas Climate Impacts

Many estimates of the impacts of the burning of natural gas, while containing a smaller carbon footprint than the burning of oil or coal, provide an incomplete picture of its contribution to global warming and environmental degradation. The process of fracking—the primary method of both oil and natural gas extraction in the U.S.—carries an extensive list of harms including the depletion of aquifers essential to food production, the increase of many life-threatening illnesses, downstream water contamination, soil degradation, decreased biodiversity, air pollution, and many other under-researched areas of concern.[10,11]

However, unlike oil, leakage of natural gas during extraction, transmission and storage carries an additional carbon burden, often not considered in its overall environmental impact. Methane, the primary component of natural gas, has a far shorter lifespan than CO_2, and comprises only 11% of U.S. greenhouse gas emissions compared to the 80% share of CO_2. However, while methane is in the atmosphere it is 100 times more effective at increasing global temperatures[12] and 84 times greater over a 20-year horizon.[13]

Overall, methane accounts for 30% of the current rise in global warming,[14] however, satellite imagery indicates that the traditional "bottom-up" estimates of

[8] Sierra Club. California's Cities Lead the Way on Pollution-Free Homes and Buildings.
[9] Davis, Lucas W., and Catherine Hausman. "Who will pay for legacy utility costs?" *Journal of the Association of Environmental and Resource Economists* 9.6 (2022): 1047-1085.
[10] Qingmin Meng, The impacts of fracking on the environment: A total environmental study paradigm, Science of The Total Environment, Volume 580, 2017, Pages 953-957.
[11] Concerned Health Professionals of New York and Physicians for Social Responsibility. Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking and Associated Gas and Oil Infrastructure (Ninth Edition), October 2023.
[12] U.S. Energy Information Administration. What are the greenhouse gases and how do they affect the climate?
[13] Intergovernmental Panel on Climate Change. Climate Change 2013: The Physical Science Basis. Cambridge: Cambridge University Press; 2013.
[14] International Energy Agency. Global Methane Tracker 2022, IEA, Paris, 2002.

methane emissions from oil and natural gas extraction fields and wells provided by the EPA may be missing between one-third to two-thirds of actual emissions. Gas stoves alone, have a national climate impact equivalent to the carbon dioxide emissions from about 500,000 gasoline-powered cars per year, due to small, persistent leaks of methane emissions, and incomplete combustion of natural gas.[15] Additionally, in California, gas stoves are present in approximately 68% of all households, well above the 35% national average,[16] with Los Angeles even higher with 81% of households, well above most major metropolitan areas.[17]

Furthermore, there is growing concern in scientific and medical communities about the adverse health impacts of natural gas and the level of danger posed by indoor air pollution. Indoor air contaminants commonly increase exposure to many pollutants two to five times greater than outdoor exposure,[18] in part because on average people spend ninety percent of their time indoors.[19] This can pose even greater hazards for infants, the elderly, and people with health conditions who typically spend even more time indoors.[20]

Criteria and Guidelines

Sensitivity to Natural Gas Pollutants

For this report, the Chief Executive Office (CEO) identified four factors that may increase sensitivity to indoor air contaminants: Population Sensitivity, Outdoor Air Quality, Socioeconomic Status, and Housing Characteristics.

Population Sensitivity

Recent research reveals heightened public health risks associated with exposure to natural gas stove emissions,[21,22,23,24] with many studies showing increased morbidity and mortality rates for the elderly, youth, and low-income households, and significant racial disparities in exposure.[25,26] Exposure to indoor pollutants

[15] Eric D. Lebel, et al, Methane and NOx emissions from natural gas stoves, cooktops, and ovens in residential homes. ES&T 2022 56 (4), 2529-2539(2022).
[16] Gruenwald, Talor, et al. "Population attributable fraction of gas stoves and childhood asthma in the United States." IJERPH 20.1 (2023): 75.
[17] ABC news. STUDY: Gas stoves emit greenhouse gases, even when not in use.
[18] U.S. Environmental Protection Agency. 1987. The total exposure assessment methodology (TEAM) study: Summary and analysis. EPA/600/6-87/002a. Washington, DC.
[19] U.S. Environmental Protection Agency. 1989. Report to Congress on indoor air quality: Volume 2. EPA/400/1-89/001C. Washington, DC.
[20] U.S. Environmental Protection Agency. 1997. Exposure factors handbook volume 3: Activity factors. EPA/600/P-95/002Fa. Washington, DC.
[21] Yannai Kashtan et al., Nitrogen dioxide exposure, health outcomes, and associated demographic disparities due to gas and propane combustion by U.S. stoves. (2024).
[22] Yannai Kashtan et al., Gas and propane combustion from stoves emits benzene and increases indoor air pollution Environmental Science & Technology 2023 57 (26), 9653-9663
[23] LEAD, APHA. Gas Stove Emissions Are a Public Health Concern: Exposure to Indoor Nitrogen Dioxide Increases Risk of Illness . (2022).
[24] Delgado-Saborit, et al. Assessment of the health impacts and costs associated with indoor nitrogen dioxide exposure related to gas cooking… (2024).
[25] Yannai Kashtan et al., *supra* note 21.
[26] Weiwei Lin, Bert Brunekreef, Ulrike Gehring, Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children, International Journal of Epidemiology, Volume 42, Issue 6, December 2013, Pages 1724- 1737,

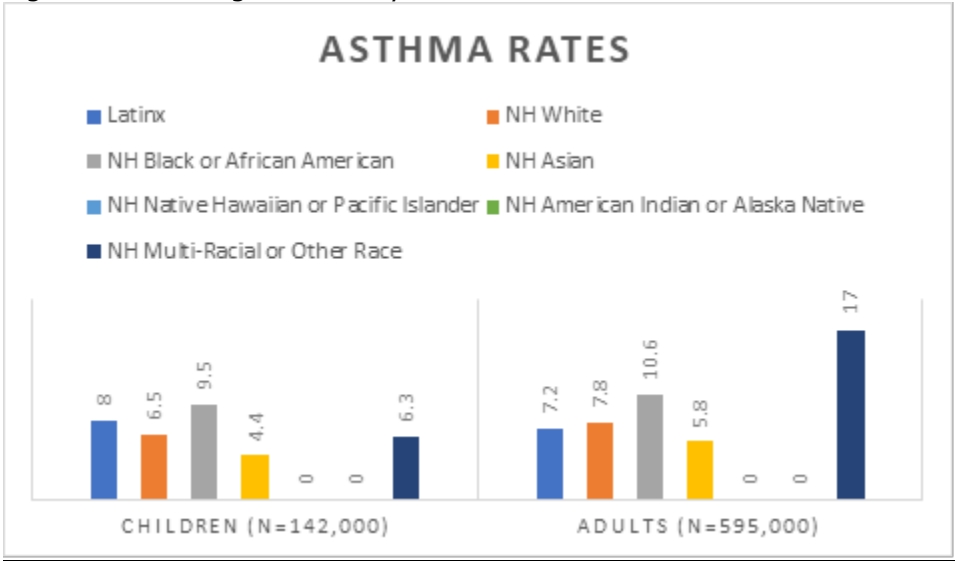
released by natural gas stoves have proven causal relationships with several adverse health outcomes. These toxic elements include benzene (leukemia, genotoxicity), carbon monoxide (ischemic heart disease); Nitrogen Dioxide (asthma, respiratory infection), and formaldehyde (sensory irritation).[27,28]

Research has established the likelihood that a 12.7% increase in childhood asthma[29] and increased rates of pneumonia in infants[30] are attributable to gas stoves. Benzene emitted from a single gas burner or oven set at 350 degrees or higher can exceed the amount in secondhand smoke. Risks of asthma, wheezing, and bronchitis resulting from benzene emissions were found to be mitigated in households that reported using ventilation in conjunction with gas stoves.[31]

Los Angeles County Asthma Rates

The 2023 LA County Health Survey highlights the impact of asthma in children and adults.[32, 33] Table 1 provides an overview of the impact of asthma in the County by age group and racial demographics.

Figure 1. Los Angeles County Asthma Rates



Outdoor Air Quality

[27] Brett C. Singer et al., Pollutant concentrations and emission rates from natural gas cooking burners without and with range hood exhaust in nine California homes, Building and Environment, Volume 122,2017, Pages 215-229.
[28] World Health Organization. "WHO guidelines for indoor air quality: selected pollutants." (2010). https://apps.who.int/ iris/handle/10665/260127.
[29] Gruenwald, Talor, et al. *supra* note 21.
[30] Coker, E.S., Smit, E., Harding, A.K. et al. A cross sectional analysis of behaviors related to operating gas stoves and pneumonia in U.S. children under the age of 5. BMC Public Health 15, 77 (2015).
[31] Kile, Molly L., et al. "A cross-sectional study of the association between ventilation of gas stoves and chronic respiratory illness in US children enrolled in NHANESIII." Environmental Health 13 (2014): 1-9.
[32] http://www.publichealth.lacounty.gov/ha/LACHSDataTopics2023.htm#Adult.
[33] ibid

Air pollution in all its forms is responsible for 9 million deaths each year, accounting for 1 in 6 deaths worldwide.[34] Research has linked air pollution to infant mortality,[35] maternal death,[36] reduced lung function,[37] cancer,[38] heart disease,[39] and many other life-threatening illnesses. Levels of ozone, CO_2, particulate matter (PM) 2.5, diesel PM, nitric oxide (NO_x)/ nitrogen dioxide (NO_2), sulfur dioxide (SO_2), volatile organic compounds, and other airborne contaminants concentrate most highly in toxic hotpots characterized by industrial clusters and transportation/goods movement corridors.

Outdoor air pollution can compound exposure to many of the same toxins produced by indoor usage of natural gas thus posing a secondary and cumulative threat to pulmonary diseases and other public health harms. The Los Angeles-Long Beach metropolitan area is currently ranked worst in the nation in high ozone days, 6th in annual particle pollution, and 11th in 24-hour particle pollution.[40] Although Southern California has witnessed fewer days with unhealthy levels of ozone in recent years, Greater Los Angeles remains the smoggiest metropolitan area in the nation.[41] While poor outdoor air quality is a regional problem, certain communities in the County, such as those located near major transportation corridors or industrial sites, have higher exposure to poor outdoor air quality. These communities are disproportionately low-income communities and communities of color.

Socioeconomic Status

Environmentally disadvantaged communities are defined by their greater exposure to contaminants borne by air, soil, and water and by a lack of access to healthy air, water, and soil brought on by socioeconomic vulnerability. The siting of new toxic-emitting industrial operations is often determined by the presence of low-income communities and communities of color.[42] Additionally, American Indian/Alaska Native, Black, and Latin American households with gas stoves experience higher exposure to NO_2 , respectively 60%, 20%, and 20% greater than the national average.[43] However, this should be evaluated in context with the relationship of race and income to dwelling size, considering smaller living spaces contain higher concentrations of toxins than more spacious dwellings.[44]

[34] Fuller, Richard, et al. "Pollution and health: a progress update." *The Lancet Planetary Health* 6.6 (2022): e535-e547.
[35] Karimi, Behrooz, and Behnosh Shokrinezhad. "Air pollution and mortality among infant and children under five years: a systematic review and meta-analysis." *Atmospheric Pollution Research* 11.6 (2020): 61-70.
[36] National Toxicology Program. "NTP monograph on the systematic review of traffic-related air pollution and hypertensive disorders of pregnancy." (2019).
[37] Thurston, George D., and Mary B. Rice. "Air pollution exposure and asthma incidence in children: demonstrating the value of air quality standards." *Jama* (2019): 1875-1877.
[38] Scientific, I. A. R. C. "Air pollution and cancer." *Lyon: IARC Scientific* (2013).
[39] Wei, Yaguang, et al. "Exposure-response associations between chronic exposure to fine particulate matter and risks of hospital admission for major cardiovascular diseases: population based cohort study." *bmj* 384 (2024).
[40] American Lung Association. State of the Air 2024. Accessed online 12/11/2024.
[41] Los Angeles Times, Los Angeles gets 'F' grade for air quality once again in national report.
[42] Pastor, Manuel, Jim Sadd, and John Hipp. "Which came first? Toxic facilities, minority move-in, and environmental justice." *Journal of urban affairs* 23.1 (2001): 1-21.
[43] Kashtan, Yannai Kashtan et al., *supra* note 21.
[44] Kashtan, Yannai et al., *supra* note 21.

Other socioeconomic factors include insufficient access to healthcare and linguistically isolated households, which are both correlated with environmentally disadvantaged communities. Monolingual non-English-speaking households are also less likely to have health insurance.[45]

Housing Characteristics

The physical quality of dwellings can influence the health of residents.[46] Low-income communities and communities of color occupy a greater share of sub-standard housing[47] and live in smaller, less well-ventilated units which provides more concentrated exposure to indoor pollution in in dwellings under 800 square feet. Residents in these smaller dwellings, if gas stoves are present, may be exposed to four times more nitrogen dioxide when compared with 3,000 square foot homes.[48]

Building decarbonization efforts that increase the energy efficiency of homes can also have unintended health consequences by increasing exposure to indoor air contaminants with more airtight envelopes.[49] This is especially true in homes with poor ventilation.[50] While new building construction tends to more effectively ventilate units, efficiency retrofits on older housing stock do not always consider the effect of airtightness on increased health risks, and may result in greater exposure to natural gas contaminants.[51]

Distribution Formula

The Anti-Racism, Diversity, and Inclusion (ARDI) Initiative recommends distribution of the SoCalGas exception fee in communities based on the pipeline mileage and the targeting of expenditures in areas where the greatest sensitivity to natural gas exposure exists. Using pipeline mileage enables us to track the likelihood of new development and the risk of exposure to natural gas in communities and allocate funds across the five Supervisorial Districts by the overall percentage of natural gas pipelines in unincorporated areas within each District.

[45] Guay, Lisa. "Addressing Linguistic Isolation through Community Based ESL and Emergency Preparedness." (2023).
[46] Eggleston, Peyton A. The Environment and Asthma in US Inner Cities. CHEST, Volume 132, Issue 5, 782S - 788S
[47] Krieger JK, Takaro TK, Allen C, et al. The Seattle-King County healthy homes project: Implementation of a comprehensive approach to improving indoor environmental quality for low-income children with asthma. Environ Health Perspective 110(suppl 2):311–322, 20
[48] Kashtan, Yannai et al., *supra* note 21.
[49] Vardoulakis, Sotiris, et al. "Impact of climate change on the domestic indoor environment and associated health risks in the UK." Environment international 85 (2015): 299-313.
[50] Dimitroulopoulou, Sani, et al. "Indoor air quality guidelines from across the world: An appraisal considering energy saving, health, productivity, and comfort." Environment International 178 (2023): 108127.
[51] Manuel J. Avoiding health pitfalls of home energy-efficiency retrofits. Environ Health Perspect. 2011 Feb;119(2):A76-9. doi: 10.1289/ehp.119-a76.

Figure 2.

LA County Supervisorial District	Pipeline Mileage	Pipeline Milage %	$5M Allocation
1 - Solis	926.06	31.4%	$1,568,073
2 - Mitchell	595.25	20.2%	$1,007,921
3 - Horvath	59.04	2.0%	$99,971
4 - Hahn	325.58	11.0%	$551,296
5 - Barger	1046.93	35.5%	$1,772,739
TOTAL	2952.86	100.0%	$5,000,000

Data provided by SoCalGas from most recent franchise statement (March/April 2024).

Indoor Air Quality Sensitivity (IAQS) Index

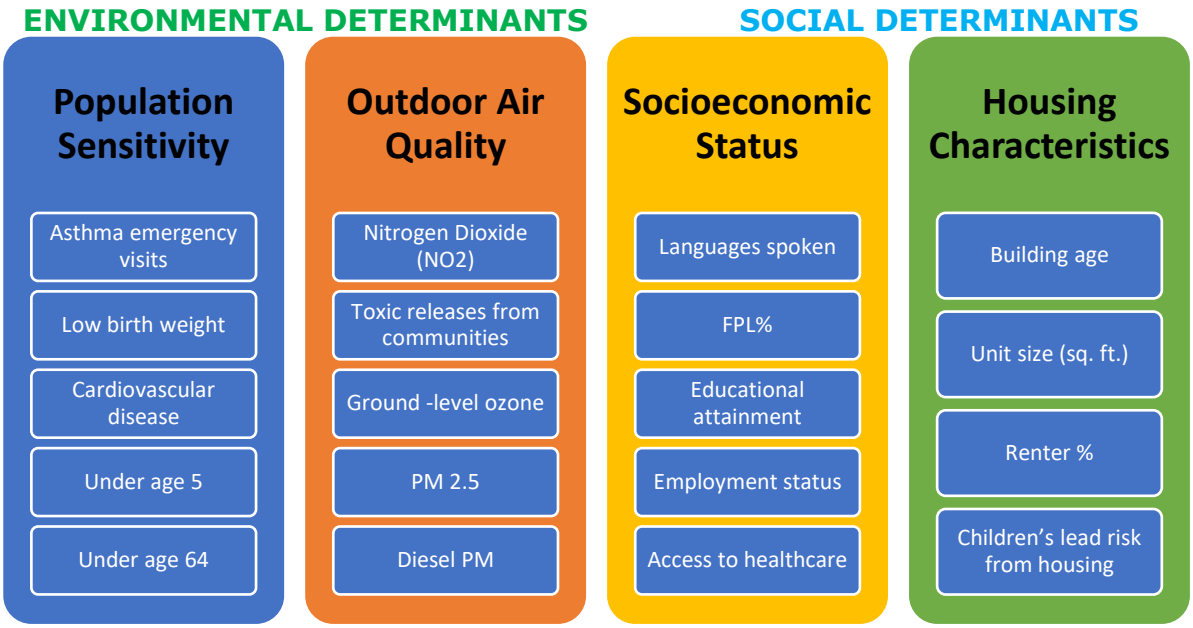
To complement the distribution formula based on the percentage of pipeline miles in each Supervisorial District, ARDI is creating an IAQS Index that uses census-tract level data to identify Unincorporated County areas where elevated sensitivity to the toxic by-products of natural gas cooking appliances is most indicated. This index could be used to support each District's ability to identify the neighborhoods within their district where Climate Equity Account Funds (CEAF) can have the greatest potential public health benefit.

Measuring Impact

Although research has established causal relationships between natural gas exposure and public health impacts, including links to outdoor air quality, socioeconomic hardship, and housing characteristics, there is a need to develop an index to assess the vulnerability of populations who are exposed to indoor air contaminants and where investment, programmatic, and policy interventions are most needed to address public health concerns. In addition to its ability to inform the expenditures of CEAF funding, the IAQS Index, can help build the capacity of practitioners and policymakers in public and environmental health, housing, clean energy, and economic justice to examine the impacts of pollutants on communities and target interventions for a broad array of interventions concerned with indoor air quality and building decarbonization.

This index is designed to assess potential public health harms with several factors when natural gas cooking appliances are present in residences. It does not attempt to identify whether those appliances are present. This approach can be beneficial to community-level investments by understanding the exacerbations of sensitivity and/or vulnerability in census tracts where higher levels outdoor air pollution may compound the threats of indoor air contamination, or where Social Determinants of Health (SDH) such as poverty, linguistic isolation, substandard housing conditions, and poor education may impact the level or quality of care that individuals and families may receive. It can also improve the geographic and individual prioritization of household-level investments where the presence of natural gas cooking appliances are known by considering smaller unit size, older housing stock, and identification of respiratory illnesses and other health conditions at the individual and census-tract level.

Table 2. Indoor Air Quality Sensitivity Index



Environmental Determinants

Indoor and outdoor environmental pollution are both harmful to people, especially those with respiratory illnesses that can experience more severe symptoms than healthier individuals. While outdoor air quality may impose greater community-wide concerns, indoor air contaminants may increase exposure to pollutants two to five times greater than outdoor exposure,[52] thus potentially presenting significantly greater adverse health impacts to individuals.

Sensitive Populations: Many toxins released by natural gas have established relationships to respiratory illnesses and other public health concerns.

- There is a significant association between elevated benzene and respiratory diseases with individuals with greater exposure 2.5 times more likely to have severe asthma symptoms.[53]
- Asthmatic children experience as much as a 29% increase in asthma symptoms with nitrogen dioxide exposures released by gas appliances.[54]
- Prevalence of neural birth defects has been found to be twice as high in mothers with elevated exposure to ambient natural gas, though the risk associated with residential exposure has not been established.[55]

Outdoor Air Pollution: Outdoor air pollution is largely associated with population-wide adverse health effects that can compound sensitivity to indoor air

[52] U.S. Environmental Protection Agency. 1987. The TEAM study: Summary and analysis. EPA/600/6-87/002a. Washington, DC.
[53] Gordian ME, Stewart AW, Morris SS. Evaporative gasoline emissions and asthma symptoms. Int J Environ Res Public Health. 2010 Aug;7(8):3051-62. doi: 10.3390/ijerph7083051.
[54] Smith, B. J., et al. "Health effects of daily indoor nitrogen dioxide exposure in people with asthma." European Respiratory Journal 16.5 (2000): 879-885.
[55] Konkel L. Birth defects and mothers' proximity to natural gas development: is there a connection? Environ. Health Perspect. 2014 Apr;122(4):A109. doi: 10.1289/ehp.122-A109.

contaminants as well as lessen or remove the benefits of home ventilation from open windows.

- In addition to sharing many of the toxic by-products of natural gas, outdoor pollution contains ground level ozone, black carbon and other toxins that are highly dangerous to public and planetary health.
- Residents living near oil refineries, high-traffic goods movement corridors, or other sources of concentrated industrial pollution, often keep their windows closed which can trap indoor air pollutants inside and increase exposure.

Social Determinants

In addition to indoor and outdoor environmental conditions, SDH have an important influence on health inequity with estimates of their impacts accounting for 30-55% of health outcomes.[56]

Socioeconomic Burdens: Socioeconomic burdens can limit healthcare options, access, and quality through a variety of determinants including poverty, unemployment, linguistic isolation, and a lack of education.[57]

- Many low-income patients are reluctant to seek help through health care providers due to high deductibles,[58] and a lack of trust in providers to not cause them harm.[59]
- Non-English monolingual households have many adverse determinants of health including a lack of translated materials, their overrepresentation in frontline workforces, and fear of identification as a "public charge" for undocumented residents.[60]

Housing characteristics: Housing characteristics can both reduce or increase the exposure to indoor air pollutants through a variety of determinants.

- Residents living in 800 square foot units can be exposed to as much as four times more nitrogen dioxide compared to those living in 3,000 square foot homes.[61]
- Renters are usually not able to sign up for home improvements such as ventilation retrofits without receiving landlord approval.
- Energy efficiency retrofits on older housing stock often do not address ventilation and result in tighter building envelopes that can trap indoor air pollutants in with residents.[62]

---

[56] World Health Organization. The social determinants of health.
[57] Tzenios, Nikolaos. "The determinants of access to healthcare: a review of individual, structural, and systemic factors." *Journal of Humanities and Applied Science Research* 2.1 (2019): 1-14.
[58] Rabin, David L., et al. "Under the ACA higher deductibles and medical debt cause those most vulnerable to defer needed care." *Journal of Health Care for the Poor and Underserved* 31.1 (2020): 424-440.
[59] Waidyaratne, Gavisha, et al. "Trust and distrust in low-income Michigan residents during the early COVID-19 pandemic: A qualitative study." *Health Expectations* 26.6 (2023): 2245-2251.
[60] Ma, Kris Pui Kwan, et al. "The impact of structural inequities on older Asian Americans during COVID-19." *Frontiers in Public Health* 9 (2021): 690014.
[61] Kashtan, Yannai et al., *supra* note 21.
[62] Manuel J., *supra* note 55.

ARDI will conduct additional research to validate the data. This will include stakeholder engagement with local community members, community-based organizations, FBOs, public health officials and other subject matter experts. Once the index's indicators and methodologies are validated, ARDI will map the data in preparation for application of the IAQS index. Over time, the index will be refined and made publicly available.

Leveraging County Programs

The City of Los Angeles, which reached a similar agreement with SoCalGas, opted to dedicate their funds to seven specific programs, which include an air purifier giveaway program, air quality monitoring at oil drilling sites, a climate vulnerability assessment, and heat mitigation in homes.

The County has several programs and projects that are either current or in development that could similarly fit the above criteria. These include but are not limited to:

- Equitable Building Decarbonization: The Internal Services Department (ISD) recently secured funding from the State to decarbonize low-income residences; the program will be administered through the Southern California Regional Energy Network.
- Technical Assistance to support resilient buildings: The Board of Supervisors recently adopted a motion directing ISD to work with CSO and other relevant departments on recommendations for the development of a technical assistance program to support decarbonization, energy efficiency, and other related strategies for building owners and operators in the County.
- Revolving loan fund for energy efficiency: The ISD currently offers low interest loans to certain government facilities. The loans support installation of energy efficiency upgrades that can then be paid back through utility savings realized through the efficiency measures.

Next Steps

Many local governments and nonprofits are engaged in "Healthy Homes" efforts in various Los Angeles subregions, such as Lancaster[63] the broader Antelope Valley,[64] Wilmington,[65] South Los Angeles,[66] Bassett and Avocado Heights,[67] Pacoima,[68] and others. ARDI will work with respective partners in the public, nonprofit, and academic sectors to develop the IAQV INDEX and vet the methodologies used to create the index and incorporate in the Equity Explorer.

[63] City of Lancaster, Healthy Homes.
[64] Antelope Valley Partners for Health, Healthy Homes America.
[65] Harbor Community Benefit Foundation, Green Homes: Los Angeles health Homes for Wilmington.
[66] Asthma Community Network. South Los Angeles Healthy Homes Program.
[67] Active SGV. Healthy Home Study.
[68] US Environmental Protection Agency. Pacoima Beautiful Safer Home Project.

CLIMATE EQUITY ACCOUNT FUNDS

All proposed expenditures should be submitted directly to ARDI and Chief Sustainability Office (CSO) for review to ensure it complies with the Criteria and Guidelines outlined in this report. Upon approval of the project by both ARDI and CSO, submitting entities should work with their CEO Budget Analyst to transfer funding from the Climate Equity Account to the appropriate budget unit, using the annual budget process including the CEO Mid-Year Budget Adjustments, to fund the project. ARDI and the CSO will provide a template and further guidance to support departmental submissions.