Advancing Health and Equity through *Better Building Products*

MINNESOTA — WORKING TOGETHER
FOR HEALTHIER AFFORDABLE HOUSING

INFORMED

May 2024

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ABOUT HABITABLE

Habitable (formerly Healthy Building Network) believes that all people and the planet will thrive when the materials economy is in balance with nature. Our team of researchers activate science to reduce pollution, mitigate climate change, and create a healthier and more equitable future for all. Our Informed™ initiative supports the built environment practitioners in selecting products with safer chemicals to improve the health of humans and the environment.

Find out more at **HabitableFuture.org**

ACKNOWLEDGEMENTS

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Executive Summary

In order to support Minnesota's affordable housing sector to improve human health and equity, Habitable (formerly Healthy Building Network) assessed the types of building products currently used in housing development and how those products affect the planet.

We evaluated building products specified across 36 projects funded through the Minnesota Housing Finance Agency (MHFA) in 2019 and 2020. Using Habitable's Informed™ materials modeling, which ranks the health impacts of products from worst- (red) to best-in-class (green), we examined the chemical make-up of products in five categories: flooring, paint, countertops, insulation, and water pipes. Informed™ takes into account the impacts of hazardous chemicals across the product life cycle: from extraction and manufacture to installation, occupancy, and end of life. We used this information to develop a baseline of the typical materials used in Minnesota's affordable housing units and their corresponding Informed™ color rankings.

Better Together The purpose of this report is to build awareness around the current state of products used, to then support engagement to co-design a strategy for improvement with local leaders.

BY THE NUMBERS

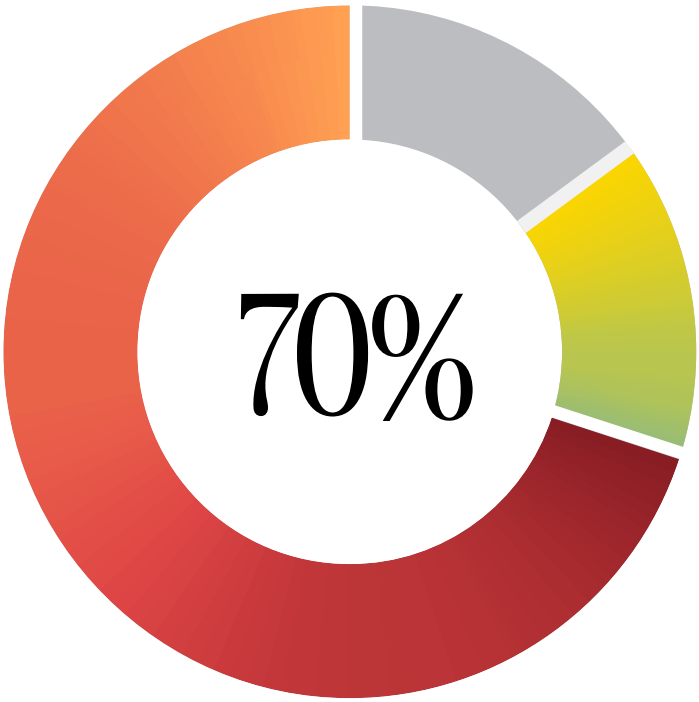
36 projects

2,100 units

~2 million square feet[1]

600 products

Key Findings



*15% of product types did not have enough information to allow us to rank as 'preferred' (yellow and green) or most polluting (red and orange), so are depicted as **grey.***

THE BAD NEWS

Red and orange ranked products — the most polluting and harmful — were ubiquitous across projects and product categories, especially in flooring and water pipes. **Nearly 70%** of the product types commonly specified across all five product categories are ranked red or orange by Informed™.

THE GOOD NEWS

Roughly 15% of product types are "preferred materials" **ranked yellow or green.** These healthier selections were found in the categories of paint and attic insulation within the reviewed projects. In addition, compliance required for Enterprise Green Communities criteria through the MN Overlay[2] drove safer material selection.

THE GREAT NEWS

There are many healthier product options available that meet cost and performance criteria — if you know what to look for. Habitable can help you find them.

SYSTEMIC ISSUE

The use of toxic and highly polluting building products is not unique to the affordable housing sector or Minnesota.[3] From a lack of transparency to inadequate government regulation, there are underlying, systemic challenges perpetuating the human and environmental harms caused by toxic chemicals in building materials throughout the product life cycle.

However, we believe that leaders in Minnesota, equipped with the right knowledge and tools, can take immediate action to chart a better path towards healthy communities.

"Not everything that is faced can be changed, but nothing can be changed until it is faced."

JAMES BALDWIN

WHY IT MATTERS

The United Nations estimates that by 2060, the entire building stock on Earth will double, adding 2.5 trillion square feet of new construction.[4] In the day-to-day decision-making of individual projects it is important that we do not lose sight of how each building contributes to overall human and environmental health–from design to construction and use to demolition and disposal.

Toxic building products inflict significant chemical exposures on people throughout their life cycle. Black and Brown communities, low-wealth populations, and children suffer disproportionate exposure to toxic chemicals and pollution.[5] These chemicals are tied to health impacts such as cancer, immunosuppression, reproductive issues, hormone interference, and other diseases.[6] As dedicated individuals and organizations work to build affordable housing units that combat social inequity in local communities, consideration of the health harms and environmental injustices tied to the building materials used can help combat social inequity in every community.

WHAT YOU CAN DO

Find out how your products rank based on their potential health impacts. Then, step up from red-ranked product types to safer options. In 2024, Habitable will engage Minnesota's built environment sector to learn more about safer product selection and co-design a "Roadmap Out of Red." **We hope you will join us.**

Explore Informed™ at **Informed.HabitableFuture.org**

Research Findings

Table 1 provides a detailed summary of Habitable's baseline findings. It includes the product types typically specified in Minnesota's affordable housing projects for flooring, paint, countertops, insulation, and water pipes, along with their Informed™ color-rankings. Product types are grouped based on their intended location where possible. For more details on the methodology we used to create the baseline, please see Appendix A.

Table 1. Baseline Findings

LOCATION	TYPICAL PRODUCT TYPE	INFORMED™ RANKINGS[7]						
FLOORING								
Kitchen, Dining, Bathrooms, Living Area	Luxury Vinyl Tile/Plank or Sheet Vinyl							
Bedrooms	Sheet Carpet							
PAINT								
Walls and Ceilings	Low VOC or APE (Alkylphenol Ethoxylate)-Free Paint							
COUNTERTOPS								
Kitchen	Plastic Laminate							
Bath – Vanity	Cultured Marble							
INSULATION								
Interior Walls / Acoustic	Unfaced Fiberglass or Mineral Wool Batts							
Exterior Cavity Walls (Framed Walls)	Fiberglass Batts							
Attic insulation	Loose Fiberglass							
Foundations, below grade walls	XPS (Extruded Polystyrene)							
WATER PIPES								
Not indicated	Copper with Solder							
Not indicated	PEX (Crosslinked Polyethylene)							
Not indicated	CPVC (Chlorinated Polyvinyl Chloride)							

Image 1. Making the Invisible Visible. Visualization of several baseline product types in a typical kitchen.[8]

Green Building Standards Influence Systems Change

Projects receiving the Housing Tax Credit allocation or other capital improvement funding from MHFA must meet the requirements of the Enterprise Green Communities standard as amended by the MN Overlay.[9]

The projects reviewed were required to meet the 2015 version of this standard. Mandatory material health criteria required interior paints and primers to have low VOC content, which incentivized paints ranked yellow, resulting in an improved baseline for materials used in these projects.[10]

Standards such as this can further influence the selection of safer product types. For example, the 2020 version of Enterprise Green Communities requires that fiberglass and mineral wool batt insulation be free of formaldehyde, a known carcinogen.[11] Required compliance with this criterion moves the common insulation materials used for interior walls into the light green ranking. The MN Overlay adopted the 2020 version of Green Communities in 2022.[12] Future versions of this, and other standards, have the potential to reduce the hazardous chemical impacts of building materials significantly.

Leaders Taking Action

Whether you're learning about the unintended impacts of material choices for the first time, or uncovering new dimensions to the issue you hadn't previously considered, the process to make better choices can seem daunting. However, there are already exciting examples of leaders making great strides on safer materials, including several in Minnesota's backyard.

PROJECT TEAMS

Across sectors, building owners, architecture firms, and designers are taking note of the health impacts of building products. These trailblazers represent several examples of project teams who have proved it is possible to select safer products, including materials that met their cost and performance criteria.

MSR Design worked with Aeon and Hope Community to select many safer building products for the Rose, a 90-unit affordable apartment building in Minneapolis, Minnesota. Most notably, this project used vinyl-free resilient flooring (ranked yellow) as an alternative to luxury vinyl tile (ranked red). This flooring swap alone eliminated more than a ton of toxic chemicals.[13]

It cost about one dollar more per square foot (first cost), but was offset by other project cost savings. It also mitigated externalized costs rarely considered in price calculations, like exposures to factory and construction workers, and associated environmental contamination.

SERA Architects and First Community Housing partnered with Habitable to avoid harmful products in the Magnolias, a 66-unit Modular Affordable Housing development located in Morgan Hill, CA. Examples of products used in this project include linoleum flooring (ranked green), quartz countertops (ranked yellow), and mineral wool board exterior continuous insulation (ranked orange).[14]

CONSTRUCTION TRADES

Construction workers are exposed to a multitude of products on any given day. Trade organizations are advocating for safer materials that protect their members' health.

Minneapolis Building and Construction Trades Council adopted a resolution (see Appendix B) to back Habitable's initiatives that build awareness and minimize construction workers' exposures. In it they call attention to the effects that building products have on their members' health. A clear example of these health impacts came in 2019 when carpet installers were sent to the emergency room after becoming sick from flooring installed in local student housing.[15]

FUNDERS

To date, architecture firms and developers have borne the burden of responsibility to design healthier buildings; however, financing and philanthropic organizations can also become leaders in the effort.

By approving and funding construction of affordable housing with the most toxic products, financing organizations are underwriting a system that perpetuates legacy harms in marginalized populations. Financing organizations in Minnesota can face this issue head-on by joining prominent industry leaders in aligning affordable housing investments with the values of health, equity, and justice. The following funding agencies have taken important steps to advance health and equity in affordable housing.

The New York City Department of Housing Preservation and Development requires project teams receiving funding to undergo material health training facilitated by Habitable. This initiative reflects a proactive approach to prioritizing the well-being and safety of occupants through informed material choices in affordable housing projects.

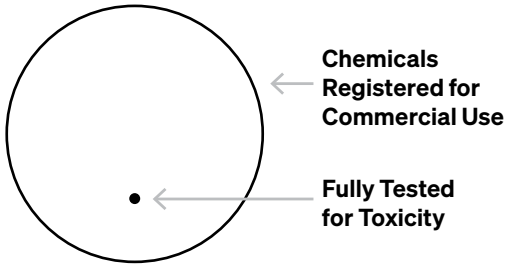
The Department of Housing and Community Development (DHCD) in Massachusetts partnered with Habitable to assess the material health performance of the products typically used by housing agencies across the state, formulate recommendations for their capital projects, and provide training to contractors and housing agencies Executive Directors. The leadership of the DHCD sends a compelling signal about the state's dedication to overseeing the development of healthy, sustainable, and affordable housing.

Overcoming Systemic Challenges Within the Industry

To reiterate: the use of toxic and highly polluting building products is not unique to the affordable housing sector or Minnesota.[3] There are many underlying reasons for this. Instead of proactively safeguarding against potential hazards, the current regulatory framework perpetuates a perilous status quo, treating chemicals as presumed safe until proven otherwise. This reactive approach leaves us grappling with crises after they unfold, and creates a system of challenges that extend beyond lack of governmental oversight.

Systems that fail to hold manufacturers accountable for their products' chemical impacts and a flawed product economy that subsidizes cheap, disposable goods are also major contributors to the pervasive use of unsafe chemicals in building products. While we work towards a future where people and the environment are better protected from hazardous chemicals, today, the burden to identify and avoid toxic materials rests with project teams: architects, real estate developers, contractors.[16]

Overcoming Systemic Challenges Within The Industry



Many people think that chemicals used in building products have been tested to ensure they are safe, but unfortunately that is not the case. Tens of thousands of chemicals are registered for commercial use with the EPA yet most haven't been adequately tested for their effects on human health.

MOVING PAST LEGACY CHALLENGES TOWARDS EFFECTIVE SOLUTIONS

There are many legacy factors we can now overcome with Informed™ guidance:

Lack of Transparency: Manufacturers have historically limited access to information on the chemical contents and associated impacts of building products they create. Despite progress in transparency driven by consumer demand, public information on the chemical makeup for most building products is still incomplete or lacking entirely due to manufacturer confidentiality claims or supply chain complexity.

Marketplace Confusion: A plethora of certifications and guidelines that rely on inconsistent levels of rigor crowd the market, leading to confusion. Additionally, manufacturers' marketing materials can overstate (i.e. "greenwash") products' health qualities and sustainability attributes. This makes it hard for project teams to definitively identify and select safer products.

Limited Life Cycle Analysis: Many of the current disclosures and product certifications today focus on the chemical content of finished products without considering chemical impacts throughout the life cycle. In practice, the product life cycle is most commonly considered through an embodied carbon lens, and does not account for other "embodied chemical impacts" or "embodied injustices" caused by chemicals throughout the supply chain. As we make pledges to advance health equity and environmental justice, a healthier product economy must take into account the full product life cycle.

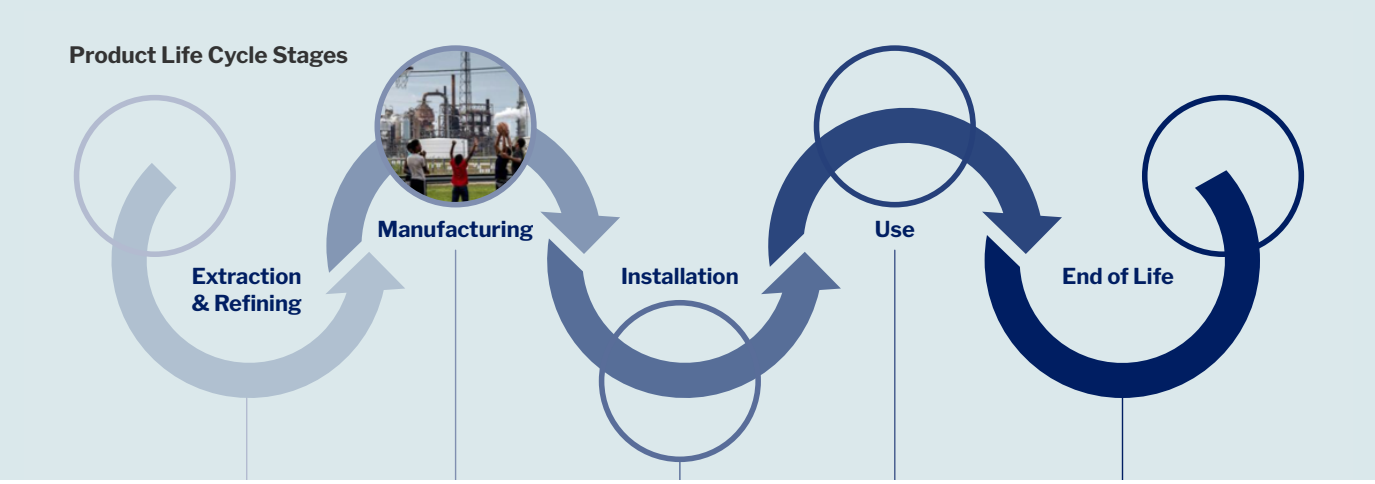
Habitable's Informed™ approach provides a solution to these challenges. It builds upon existing disclosures without relying on manufacturer-controlled data or certifications, and considers the chemical impacts of products throughout their life cycles. This independent, scientifically-backed guidance breaks through the noise to simplify safer product selection. Since 2016, Habitable has engaged affordable housing practitioners across the country to help shape Informed™ so that our guidance and resources support the unique needs of project teams.

COST AND PERFORMANCE

Effective product choices that prioritize health and meet cost and performance requirements are available today. For instance, project teams can integrate healthier paint and insulation products ranked yellow and green with little-to-no cost impact. Some healthier alternatives may require a cost premium, but this can often be addressed through creative cost saving measures, including:

- **Bulk purchasing:** Some groups are working together on procurement strategies to coordinate higher purchase volumes that result in cost reductions.
- **Manufacturer discounts:** Nonprofits can request discounted or tax-exempt pricing.
- **Test materials before going all in:** CommonBond Communities used linoleum in common areas for their Dublin Crossing development in Mankato, Minnesota in order to gain first-hand experience with the durability and maintenance of a new flooring material with limited and acceptable risk.
- **Decreasing waste:** Affordable housing developer First Community Housing offsets the higher cost of linoleum by carefully designing the footprint of the apartment units to match floor plank dimensions. This strategy minimizes product waste, not only decreasing the amount of flooring purchased, but also preventing virgin materials from being sent to landfill.

Full Life Cycle: Health for Occupants and Beyond



The perceived health impacts of building materials are often mistakenly limited to the service life of the material within a building and the impact to building occupants during that time. The truth is that, in addition to building occupants, toxics can produce harmful effects to people and the planet throughout the entire product life cycle, from manufacturing to installation, and end of life. Additionally, although chemical exposures affect everyone, research shows that people of color, low-wealth populations, and children suffer disproportionate exposures to toxic chemicals and pollution.[17]

DISPROPORTIONATE HARM TO VULNERABLE POPULATIONS

Decades of systemic racism and racist policies such as redlining have resulted in a greater concentration of pollution sources (such as manufacturing facilities), polluting industries, and contaminated sites in BIPOC communities compared to predominantly white ones.[18] At the same time, these communities are also the most vulnerable to these pollutants due to socioeconomic inequalities rooted in racist policies and practices impacting their ability to sustain their health and well-being.[19]

Children are especially sensitive to chemical exposures, which can come from products in their homes and schools, as well as pollution from surrounding industry. Beginning in the womb and continuing into adolescence, their cells and bodies are in a dynamic state of growth. Chemical exposures can interrupt hormone systems, damage organs, and are a suspected cause of increased rates of childhood cancers like leukemia and neurological disorders like ADHD. Babies in utero are impacted by the chemicals in their mother's environment, and research has found that umbilical cord blood can contain hundreds of industrial chemicals.[20] The science is clear: exposure to toxic chemicals early in life can lead to significant detrimental conditions that can continue to affect health years later.

TOXIC IMPACTS ACROSS ECOSYSTEMS

Contamination of the environment with toxic chemicals contributes to a range of issues across the globe. Environmental contamination can lead to reduced property values in and around contaminated areas, loss of income and food production from the contamination of farms, and expenditures from costly cleanup activities.[21] Chemical pollution is also wreaking havoc on wildlife and ecosystems around the world. For example, materials used in synthetic turf which are found in the associated runoff water are toxic to fish,[22] and flame retardants used in plastic foam insulation can travel long distances and have been found even in remote locations like the Arctic.[23] The United Nations Environment Programme notes the far-reaching implications of toxics stating, "Chemical pollution threatens ecosystem functions by adversely affecting pollinators, contributing to ocean dead zones, accelerating antimicrobial resistance, and increasing pressure on coral reefs."[24] When it comes to the impacts of toxic chemicals, no habitat is spared.

Made in Cancer Alley?

Do you know where your product was made or how it affects the people that live near and work in its production facilities?

The city of Geismar, Louisiana is home to 18 facilities that report to the EPA's Toxics Release Inventory. These facilities reported a total of over 15 million pounds of on-site releases of hazardous chemicals to air, water, and land in 2019. Several of these facilities produce chemicals used in the building product supply chain. For example, two facilities produce chlorine for internal or external production of vinyl (aka PVC), which can be used to make pipes, siding, windows, flooring, and other building products. Two other facilities manufacture a key ingredient used in spray polyurethane foam (SPF) insulation. The community of Geismar is disproportionately Black—35 percent of the population compared to 12 percent in the US overall–and 30 percent of the population are children. Geismar is part of the area along the Mississippi River between New Orleans and Baton Rouge known as "Cancer Alley" because of the concentration of industrial activity and the associated elevated cancer risks.[25] Chemicals released from the facilities in Geismar are tied to health impacts including cancer, reproductive issues, neurological impairment, hormone interference, changes to the immune system, and more.[26]

Spotlight on Flooring

If you care about decreasing reliance on fossil fuels, or if you want to reduce plastic waste, take a closer look at the materials you stand on. Carpet and vinyl flooring are ubiquitous in our buildings, including affordable housing. In addition to their toxic chemical profiles, both flooring materials are plastic products and contribute to the growth of fossil fuel use and plastic pollution.

Plastics–almost entirely derived from fossil fuels—are antithetical to climate efforts. The irony of electrifying our buildings to turn off the fossil fuel tap, only to turn it back on in order to construct them with plastic, cannot be overlooked. As U.N. Secretary-General António Guterres stated: "Plastics are fossil fuels in another form and pose a serious threat to human rights, the climate & biodiversity."[32] It is critical that we reduce plastic building products in the same way that we are phasing out fossil-fuel based energy. Selecting long-lasting non-plastic alternatives can drastically cut waste and mitigate environmental health consequences.

FACTS ABOUT CARPET: DID YOU KNOW?

- The U.S. is the largest manufacturer and consumer of carpet in the world.[27]
- The U.S. carpet industry reports that approximately 2 million tons of carpet are disposed of every year, the equivalent of ~1.2 million tons of plastic.[28] That's roughly equivalent to the amount of all plastic straws, bags, and water bottles disposed of in the U.S. each year combined.[29]
- In Minnesota alone more than 67,000 tons of carpet was discarded in one year. That amounts to 2.3% of total annual municipal solid waste and almost twice as much waste as PET beverage containers, clamshells, and jars tossed in Minnesota in the same year.[30]
- Habitable's research has shown that the typical lifespan of commercial and multi-family carpet is 3-7 years.[31]

LEARN MORE:

- Impacts of plastic building products: "Our Plastic Buildings - the New Driver of Fossil Fuel Demand"
- Optimizing for embodied carbon and material health: "Embodied Carbon and Material Health in Gypsum Drywall and Flooring" and "Embodied Carbon and Material Health in Insulation"

BY THE NUMBERS

Swapping carpet and vinyl flooring made of plastic (ranked orange and red) for linoleum (ranked green), a healthier product made mostly from low-hazard minerals and biological materials, results in the avoidance of:

230 lbs
OF PLASTIC PER HOUSING UNIT[33]

11.5 tons
OF PLASTIC IN A 100-UNIT BUILDING

66 tons
OF PLASTIC AVOIDED BY THAT ONE BUILDING OVER A 50-YEAR PERIOD[34]

Take Action

Step Up from **Red-Ranked Products**

As this report demonstrates, we have some work to do. Leaders in Minnesota interested in ending the legacy harms against human and environmental health are in a prime position to start taking action today.

Make sure the next affordable housing project you work on reflects your core values. Take a stand in fighting persistent societal inequities by eliminating product types ranked red by Informed™ from your material specifications. Even if you're unable to transition fully to green-ranked products, selecting materials with orange and yellow rankings will still result in a meaningful improvement to the health of a building and the communities touched by every stage of a product's life cycle.

The decisions you make today will have a lingering impact on the world that we, and future generations, inhabit tomorrow. The real estate industry has the power to solve this issue and improve health on a planetary scale–let's work together to make it a reality!

EXAMPLE PRODUCT GUIDANCE: FLOORING

✓ Prefer	• Linoleum • Solid Wood Floors (pre-finished) • Concrete (no finish/accessories or only densifier without PFAS)
✓ Prefer	• Ceramic Tiles (no added lead) • Solid Wood Floors (site-finished) • Cork Floors (pre-finished)
✓ Prefer	• PVC-free Resilient Flooring • Engineered Wood Floors (pre-finished)
Reduce	• Rubber or Rubber/Cork Floors (made without tire-derived crumb rubber) • Laminate • Carpet (with no fly ash, no vinyl or polyurethane backing, and no PFAS) • Polyurethane (PU) Resilient Flooring • Engineered Wood Floors (site-finished)
Avoid	• Vinyl Floors (no phthalates or hazardous recycled content) • Ceramic Tiles (with added lead) • Concrete (with sealers or with densifiers/coatings containing PFAS)
✗ Avoid	• Rubber or Rubber/Cork Floors (made with tire-derived crumb rubber) • Carpet (containing fly ash, vinyl or polyurethane backing, and PFAS) • Vinyl Floors (containing phthalates, hazardous stabilizers, and hazardous recycled content)

Begin working toward a healthier future by following these steps below:

1. **Build Knowledge** Learn at your own pace with **Habitable's Informed™ Product Guidance.** You can also integrate Informed™ into your workflow with our **Product Explorer** and **Assessment Form** reports.
2. **Start Somewhere** Don't let perfect be the enemy of good. Begin by **choosing one product category** where you can step up from red-ranked products and celebrate your progress as you continue to select better options. Start today.
3. **Get Involved** In 2024, Habitable will engage Minnesota's built environment sector to learn more about safer product selection and co-design a "Roadmap Out of Red." We hope you will join us.

Contact us at **Informed@HabitableFuture.org**

1. This is an estimate, assuming an average unit size of 1,000 square feet.

2. See Green Building Standards Influence Systems Change breakout box for more information.

3. Our findings are consistent with typical products used in other building types and geographic regions. See for example Habitable's baseline data collection for the Pacific Northwest, California, Louisiana, and Washington, DC for projects designed between 2012 and 2016, available here: https://informed.habitablefuture.org/baseline-specifications We have also identified common product types used in office buildings in the United States, where carpet is the typical flooring for most of the building, fiberglass batts are commonly used for exterior framed walls, and XPS is common for below grade walls. Additional information and sourcing available upon request.

4. UN Environment and International Energy Agency (2017): Towards a zero-emission, efficient, and resilient buildings and construction sector. Global Status Report 2017. https://globalabc.org/sites/default/files/2020-09/2017%20GlobalABC%20GSR%20.pdf.

5. Agency for Toxic Substances & Disease Registry. "Principles of Pediatric Environmental Health: Why Are Children Often Especially Susceptible to the Adverse Effects of Environmental Toxicants?," May 25, 2023. https://www.atsdr.cdc.gov/csem/pediatric-environmental-health/why_children.html.; Donaghy, Tim, and Charlie Jiang. "Fossil Fuel Racism: How Phasing Out Oil, Gas, and Coal Can Protect Communities," April 13, 2021. https://www.greenpeace.org/usa/reports/fossil-fuel-racism/.; Woodruff, Tracey J., et al. "A Science-Based Agenda for Health-Protective Chemical Assessments and Decisions: Overview and Consensus Statement." Environmental Health 21, no. 1 (January 12, 2023): 132. https://doi.org/10.1186/s12940-022-00930-3.; Liddie, Jahred M., Laurel A. Schaider, and Elsie M. Sunderland. "Sociodemographic Factors Are Associated with the Abundance of PFAS Sources and Detection in U.S. Community Water Systems." Environmental Science & Technology 57, no. 21 (May 30, 2023): 7902–12. https://doi.org/10.1021/acs.est.2c07255.

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7. You can find more information about how the rankings are developed in our Informed Methodology and why different product types are ranked as they are in our Product Guidance. We are continually researching the common formulations and hazards of building products. As new information emerges and our guidance evolves, new product types may be added and there may be adjustments to where a product type falls. The color rankings in this table are based on the guidance at the time of the project reviews, summer 2023.

8. Where the baseline is more than one color ranking, the range is shown for paint and the better option is shown for the flooring.

9. Minnesota Housing Finance Agency. "Minnesota Overlay and Guide to the 2015 Enterprise Green Communities Criteria," April 2019. https://www.mnhousing.gov/get/MHFA_189860.

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12. Minnesota Housing Finance Agency. "Building Standards." Accessed September 25, 2023. https://www.mnhousing.gov/rental-housing/building-standards.html.

13. Based on product composition at the time of selection and avoidance of hazardous orthophthalates used in vinyl flooring. Orthophthalates can be developmental toxicants. See, for example,the US National Toxicology Program Monograph on DIDP: https://ntp.niehs.nih.gov/sites/default/files/ntp/ohat/phthalates/didp/didp_monograph_final.pdf.

14. Exterior continuous insulation was not commonly included in the specifications reviewed so is not listed in the summary baseline findings in Table 1. When exterior continuous insulation was specified it was XPS, SPF, or polyisocyanurate—all ranked red—so this represents a step out of the red for this application.

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19. Patnaik, Aneesh, Jiahn Son, Alice Feng, and Crystal Ade. “Racial Disparities and Climate Change.” PSCI, August 15, 2020. https://psci.princeton.edu/tips/2020/8/15/racial-disparities-and-climate-change.

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Appendix A: Baseline Methodology

Habitable assessed building products specified across 36 projects (2100 units) approved for funding by the Minnesota Housing Finance Agency (MHFA) in 2019 and 2020. We collected data from project specification documents to determine the product types specified. Where possible, we grouped product types based on their intended use location. We used project specifications because this was the information that was publicly accessible. Actual products installed may vary from the specifications, but the baseline reflects best available information.

We used Habitable's Informed™ materials modeling to rank more than 600 specified products in five product categories: flooring, paint, countertops, insulation, and water pipes in terms of their impacts across the product life cycle. Best-in-class products are green and worst products are red. You can find more information about the Informed methodology on our website.

From this information, we developed a "baseline" of the typical product types used in MNHFA funded projects and their ranking per Informed (Table 1). We considered product types to be typical when they were represented in more than 60% of the projects assessed. When multiple product types were found to be equally common, both are listed as the baseline. Where the baseline is more than one color ranking, all possible rankings are included as the baseline.

Not all project documents listed products for every category or specific use location. Some use locations were not found to be common in the specifications, so are not listed in the summary findings in Table 1 and are not included in the summary analysis. For example, underslab insulation was not commonly included in the specifications, but when it was specified it was XPS (ranked red). Exterior continuous insulation was also not commonly included in the specifications, but when it was specified it was XPS, spray polyurethane foam (SPF), or polyisocyanurate—all ranked red. In addition, the flooring analysis focused on product types used within the units. Other types of flooring may be commonly used in other specific areas such as fitness areas, common restrooms, or lobbies.

As noted in the Green Building Standards Influence Systems Change text box, the 2015 version of Enterprise Green Communities was used in the MN overlay at the time of the projects reviewed. Since then, the 2020 version of Green Communities was adopted in the MN overlay. While a new required criterion for insulation would shift the baseline interior walls/acoustic insulation from light green and orange to only light green, no other changes to the baseline color rankings are expected as a result of the adoption of this version of the standard. As a result, the baseline findings are still broadly applicable.

Appendix B: Minneapolis Building and Construction Trades Council Resolution

Whereas, the members of the Minnesota Building and Construction Trades Council are exposed to a myriad of products and materials that are used to construct these buildings; and

Whereas, we have seen the effect that products such as asbestos have had on our member's health; and

Whereas, the Healthy Building Network has been formed to focus on reducing the heath effects that toxic building materials have on building users; and

Whereas, our members often have much greater exposures to these materials during their installation; and

Whereas, the health and safety of our members is our number one most important issue; therefore be it

Resolved, that the Minnesota Building and Construction Trades Council go on record supporting the efforts of the Healthy Building Network to reduce the use of toxic materials in Construction; and be it further

Resolved, that the Council support efforts to educate architects, engineers, contractors and construction workers on the effects that exposure to such toxic materials can have on the health of those who work with these materials and be it further

Resolved, that if these materials cannot be avoided we support efforts to educate on how to safely handle, install and maintain these materials.