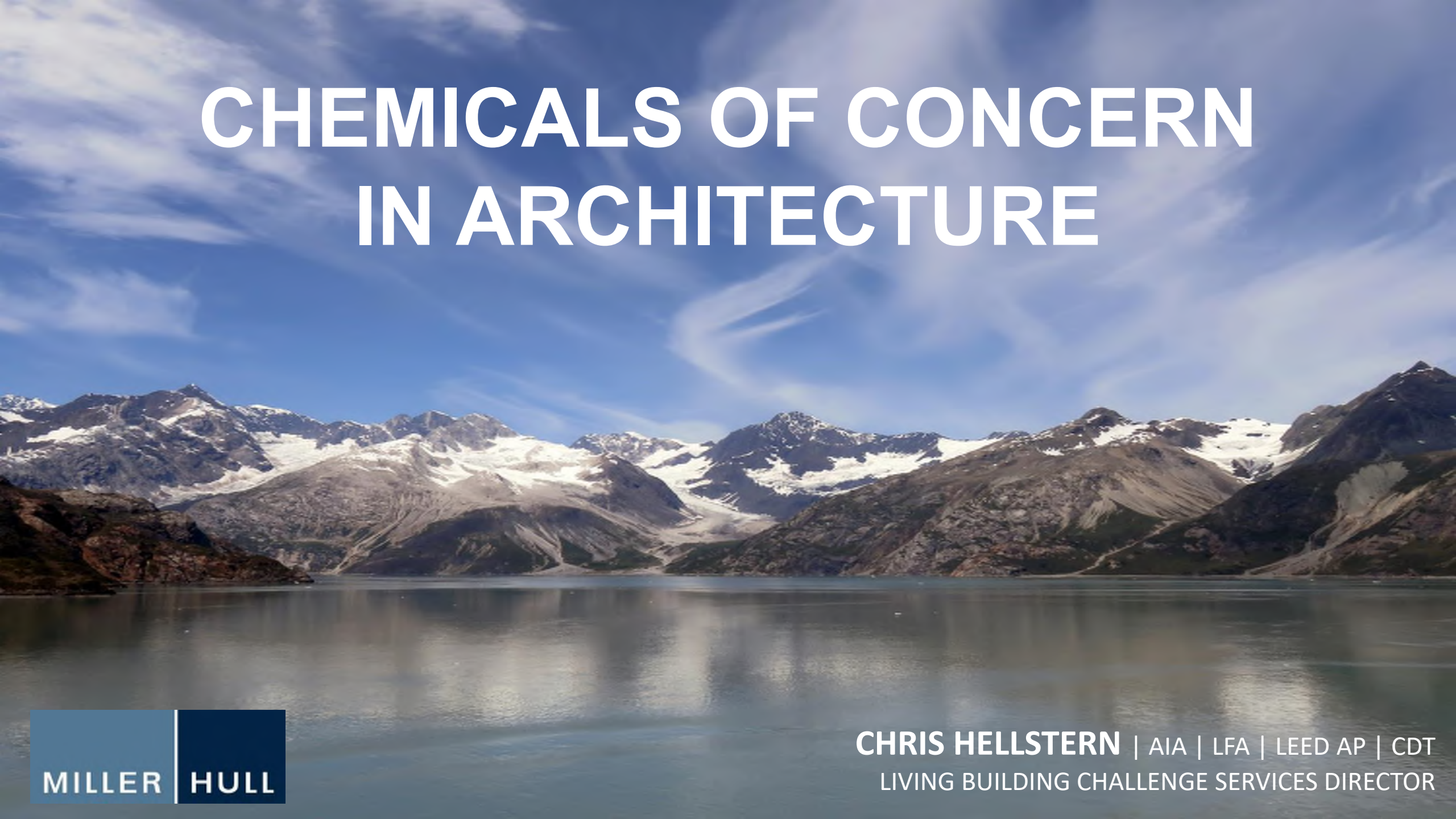
CHEMICALS OF CONCERN IN ARCHITECTURE



MILLER | HULL

CHRIS HELLSTERN | AIA | LFA | LEED AP | CDT
LIVING BUILDING CHALLENGE SERVICES DIRECTOR

Today's Agenda

Challenges Section

- Chemicals of concern intro
- Detail on select chemicals of concern
- Chemical Impact (Human & Environmental)
- Social Justice concerns

Hope Section

- Action we can take
- Regulation examples
- Example Projects
- Q&A

Slides will be made available

MILLER HULL

Just.

Organization Name: The Miller Hull Partnership, LLP
Organization Type: Architecture
Headquarters: Seattle, Washington
Satellite Facilities: San Diego, California
Number of Employees: 97

Social Justice and Equity Indicators:

Diversity
- Non-Discrimination
- Gender Diversity
- Ethnic Diversity

Equity
- Full Time Employment
- Pay-Scale Equity
- Employee Friendly
- Living Wage
- Gender Pay Equity
- Family Friendly

Safety
- Occupational Safety
- Hazardous Chemicals

Worker Benefit
- Worker Happiness
- Employee Benefit
- Continuing Education

Local Benefit
- Local Control
- Local Sourcing

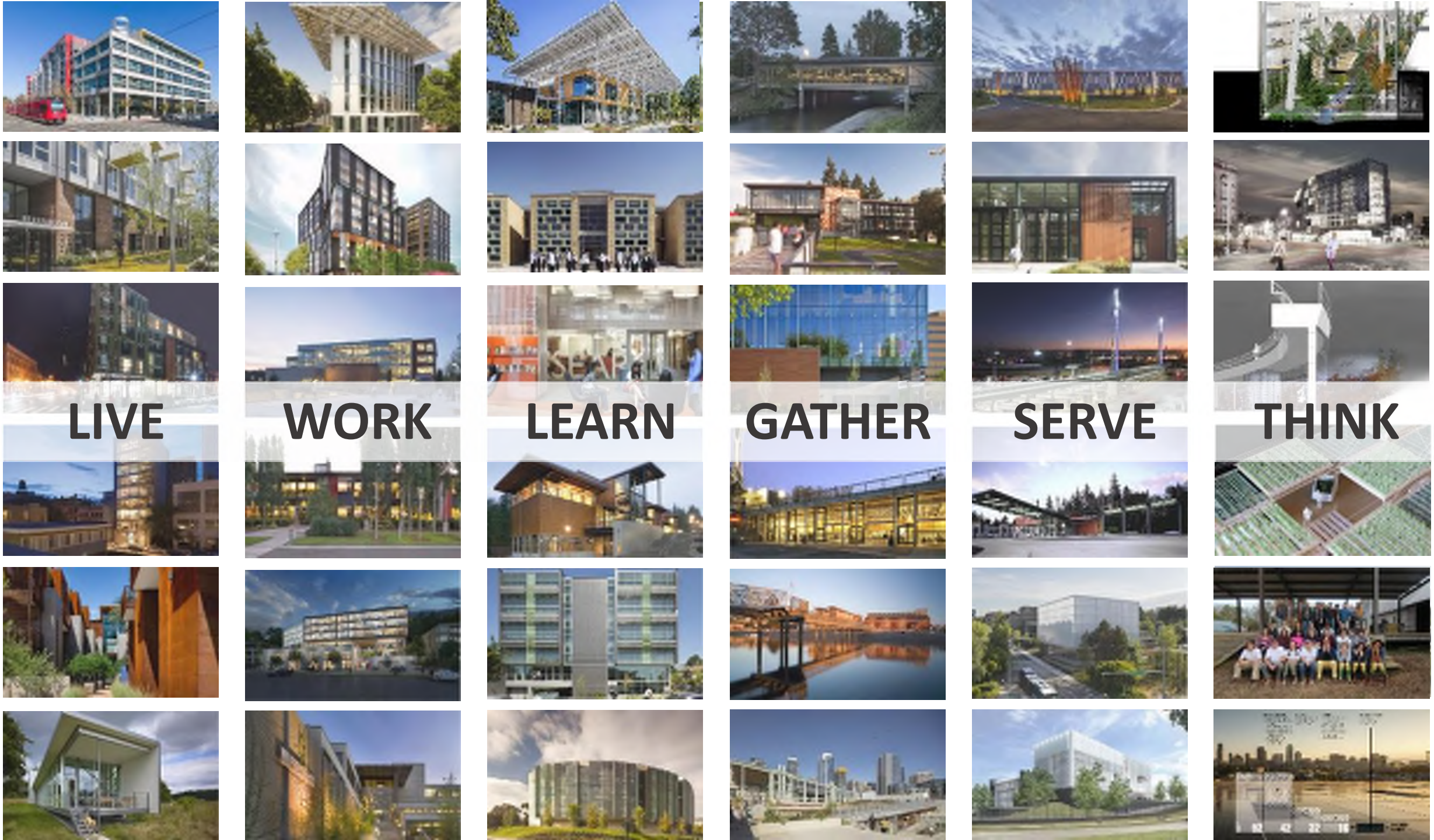
Stewardship
- Responsible Investing
- Community Volunteering
- Positive Products
- Charitable Giving
- Animal Welfare
- Transparency

THE SOCIAL JUSTICE LABEL
MHP-001 EXP. 01/05/2021

INTERNATIONAL LIVING FUTURE INSTITUTE™ justorganizations.com

Seattle
LBC 3.1

San Diego
LBC 4.0


LIVE
WORK
LEARN
GATHER
SERVE
THINK


SEWARD ADMINISTRATION FACILITY & INTERPRETATION CENTER
LIONS GATE WASTEWATER TREATMENT PLANT
HAGMANN RESIDENCE
WEST SUPERIOR CONDOMINIUMS
UNIVERSITY OF MICHIGAN COLLEGE OF ART & ARCHITECTURE
FIRE STATION 32
BULLITT CENTER
POWELL RIVER LIBRARY
UNIVERSITY OF IDAHO COLLEGE OF EDUCATION
RENTON LIBRARY
WILLAMETTE WATER TREATMENT PLANT
TILLAMOOK FORESTRY CENTER
THE SAHU
AMERICA'S CUP HARBOR
INTREPID LANDING
GEORGIA INSTITUTE OF TECHNOLOGY LIVING BUILDING
BEISHAN TOWN LOCAL HISTORY MUSEUM
IDEO
SAN DIEGO ZOO AFRICA ROCKS
SAHBI BRIVE CONDOMINIUMS
US EMBASSY OF GUATEMALA
EAST KAPOLEI MIDDLE SCHOOL
US EMBASSY OF NIGER
ABU SAMRA LAND PORT OF ENTRY
GOHAR KHATOON GIRLS SCHOOL

9* LIVING BUILDINGS








* Six certified, two under construction + one in design (not pictured)


MATERIALS TOXICITY

Most Chemicals are not effectively regulated

- ~62,000 Chemicals are grandfathered
- ~23,000 New Chemicals have been introduced
  - 85% Have no health data
  - 67% Have no data at all

--Green Science Policy Institute

Chemicals subject to **TSCA**

The Toxic Substances Control Act of 1976 provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.

6

1. PCBs
2. Asbestos
3. Radon
4. Lead
5. Mercury
6. Formaldehyde

Certain substances are generally **excluded** from TSCA, including, among others, food, drugs, cosmetics and pesticides.

Six Classes of Harmful Chemicals

1	2	3	4	5	6
Highly Fluorinated	Antimicrobials	Flame Retardants	Bisphenols + Phthalates	Some Solvents	Certain Metals

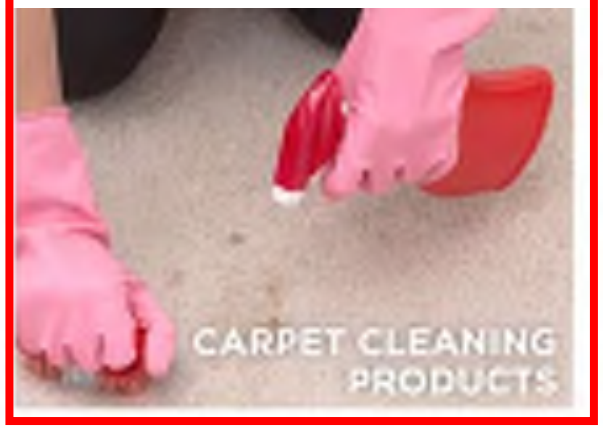





Antimicrobials

Flame Retardants

PFAS (Fluorinated Chemicals)



BPA


CANNED FOOD LINERS


PLASTIC CONTAINERS


EPOXY ADHESIVES


CASH REGISTER RECEIPTS


VINYL FLOORING


FLEXIBLE PVC PIPES


TOYS


CAULKS AND ADHESIVES


FOOD PACKAGING


TEETHING TOYS


PERSONAL CARE PRODUCTS


SPORTS EQUIPMENT

Phthalates *(thal-lates)*

Detected in 97% of all people tested


Persistent
Bioaccumulative
Toxins
“Forever Chemicals”

Fluorochemicals

Found in:

- Carpeting
- Upholstery
- Apparel
- Food Packaging
- Non-stick cookware
- Dental Floss

Health Affects:

- Kidney, prostate, ovarian, testicular cancer
- Thyroid Disease
- Delayed puberty, decreased fertility
- Reduced Testosterone
- Reduced Immune Response
- Elevated Cholesterol

Nearly 100% of people tested in the United States have two phased-out PFC's in their blood:

- **PFOS (Scotchgard)**
- **PFOA (Teflon)**

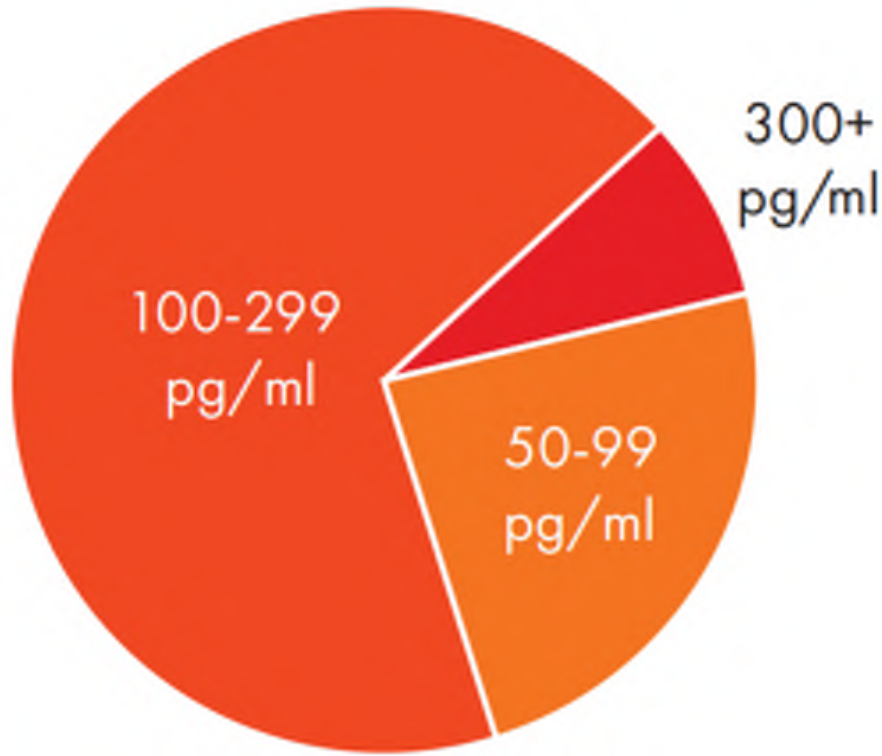
--National Geographic

Toxic Chemicals in Breast Milk

How we can solve this problem

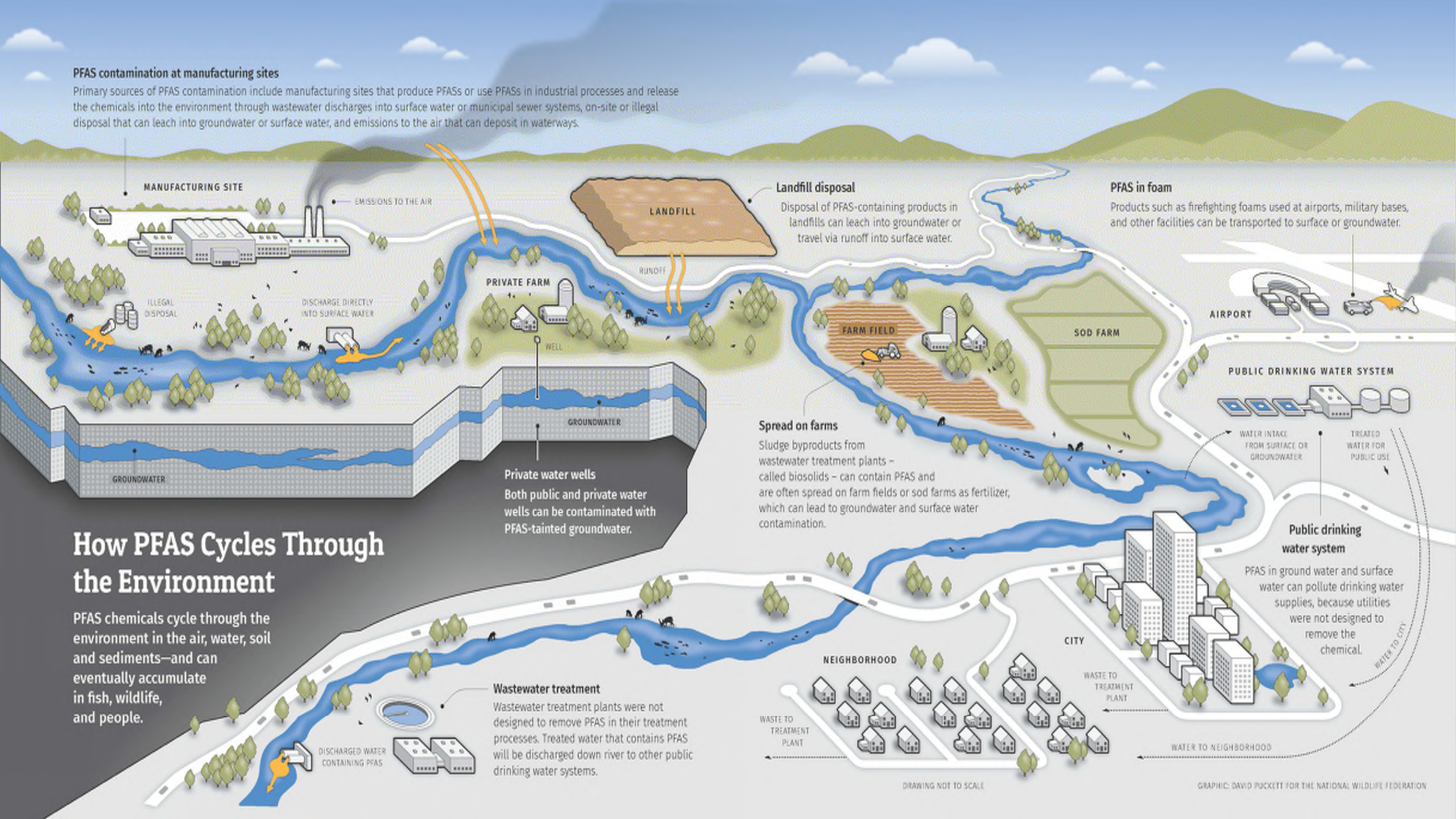
100% of Tested Breast Milk Samples Contained PFAS

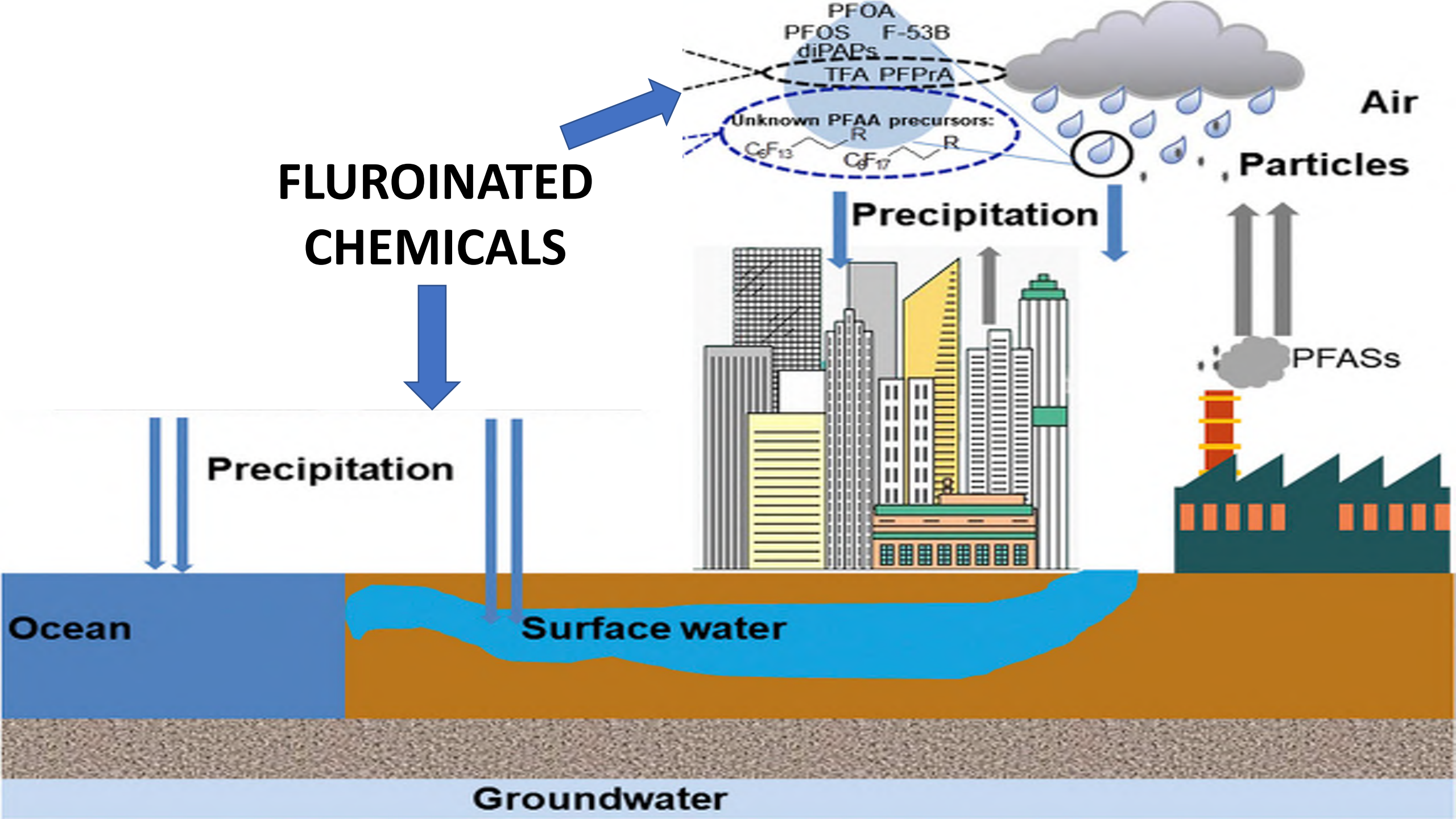
PFAS Levels in Breast Milk from 50 Mothers



TOXIC-FREE FUTURE

SCIENCE • ADVOCACY • RESULTS


PFAS contamination at manufacturing sites
Primary sources of PFAS contamination include manufacturing sites that produce PFASs or use PFASs in industrial processes and release the chemicals into the environment through wastewater discharges into surface water or municipal sewer systems, on-site or illegal disposal that can leach into groundwater or surface water, and emissions to the air that can deposit in waterways.
MANUFACTURING SITE
EMISSIONS TO THE AIR
ILLEGAL DISPOSAL
DISCHARGE DIRECTLY INTO SURFACE WATER
LANDFILL
RUNOFF
Landfill disposal
Disposal of PFAS-containing products in landfills can leach into groundwater or travel via runoff into surface water.
PFAS in foam
Products such as firefighting foams used at airports, military bases, and other facilities can be transported to surface or groundwater.
AIRPORT
PRIVATE FARM
WELL
GROUNDWATER
GROUNDWATER
Private water wells
Both public and private water wells can be contaminated with PFAS-tainted groundwater.
FARM FIELD
SOD FARM
Spread on farms
Sludge byproducts from wastewater treatment plants – called biosolids – can contain PFAS and are often spread on farm fields or sod farms as fertilizer, which can lead to groundwater and surface water contamination.
PUBLIC DRINKING WATER SYSTEM
WATER INTAKE FROM SURFACE OR GROUNDWATER
TREATED WATER FOR PUBLIC USE
How PFAS Cycles Through the Environment
PFAS chemicals cycle through the environment in the air, water, soil and sediments—and can eventually accumulate in fish, wildlife, and people.
Public drinking water system
PFAS in ground water and surface water can pollute drinking water supplies, because utilities were not designed to remove the chemical.
CITY
NEIGHBORHOOD
WASTE TO TREATMENT PLANT
WASTE TO TREATMENT PLANT
WATER TO CITY
WATER TO NEIGHBORHOOD
DISCHARGED WATER CONTAINING PFAS
Wastewater treatment
Wastewater treatment plants were not designed to remove PFAS in their treatment processes. Treated water that contains PFAS will be discharged down river to other public drinking water systems.
DRAWING NOT TO SCALE
GRAPHIC: DAVID PUCKETT FOR THE NATIONAL WILDLIFE FEDERATION


FLUROINATED CHEMICALS
PFOA
PFOS F-53B
diPAPs
TFA PFPrA
Unknown PFAA precursors:
R
R
Air
Particles
Precipitation
PFASs
Precipitation
Ocean
Surface water
Groundwater

Grist

The Olympics just saw its first ‘forever chemical’ disqualifications

Waxes containing PFAS are banned at the Milan-Cortina Games. Three athletes already have been disqualified for using them.

PVC (Vinyl)


East
Palestine,
Ohio

The Vinyl/Asbestos connection stems from:

=

PVC production is the **largest single use for industrial chlorine**

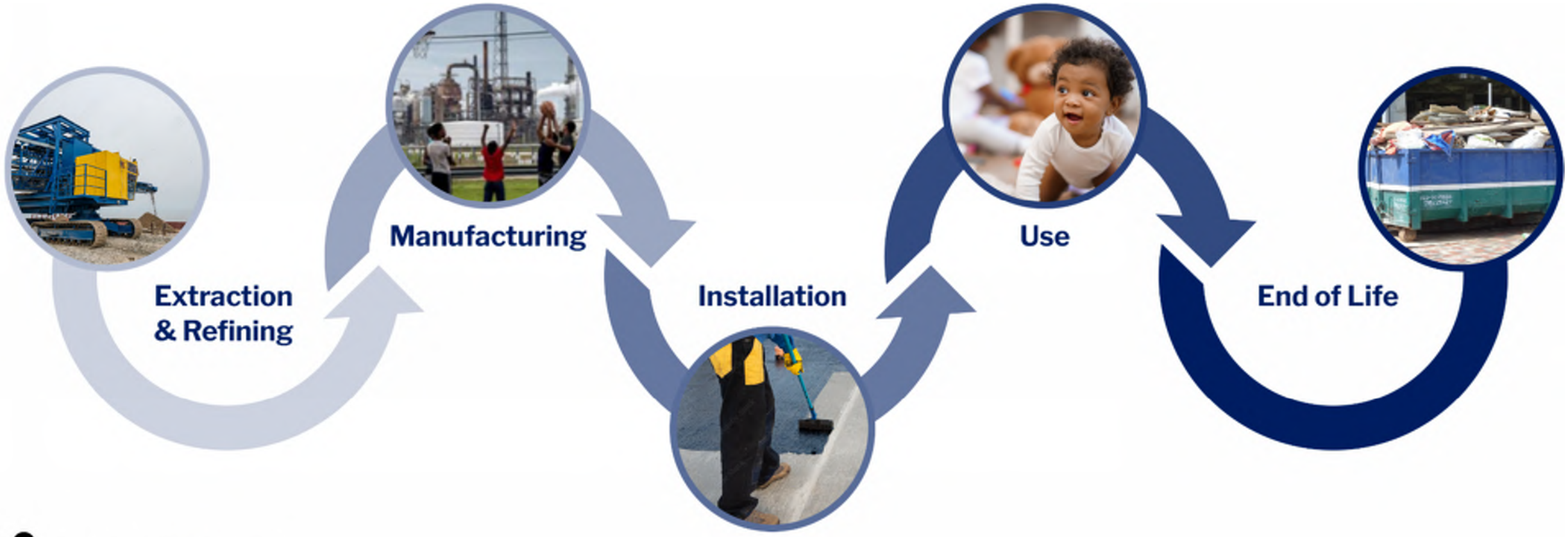
Chlorine production is the **largest single consumer of asbestos** in the US


*What will be the **lead** of the future?*
Flint…Newark…Olympia…

Chemicals of Concern Create Emissions

CHEMICAL IMPACT ON HUMAN HEALTH

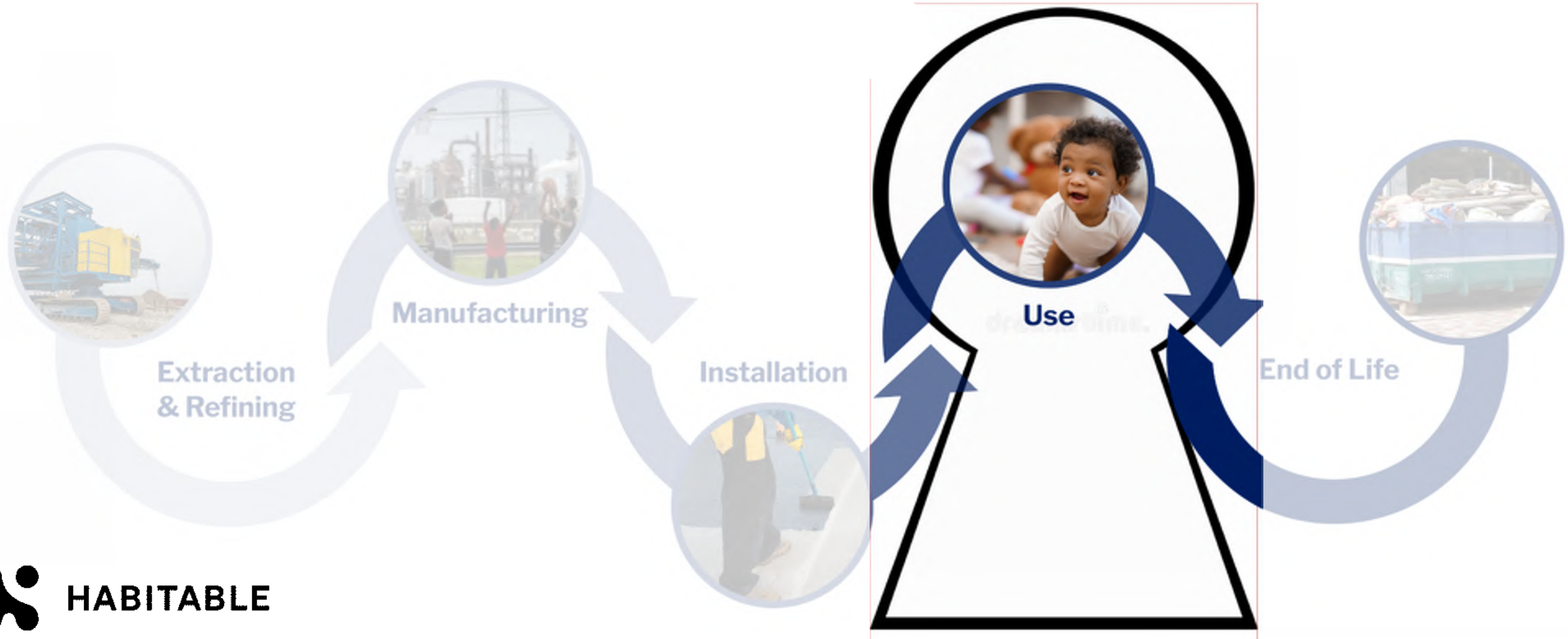
The Lifecycle of our Materials and Products



HABITABLE

Problem: Looking through a keyhole at the finished product

…ignores life-cycle impacts and exposures along the supply chain.



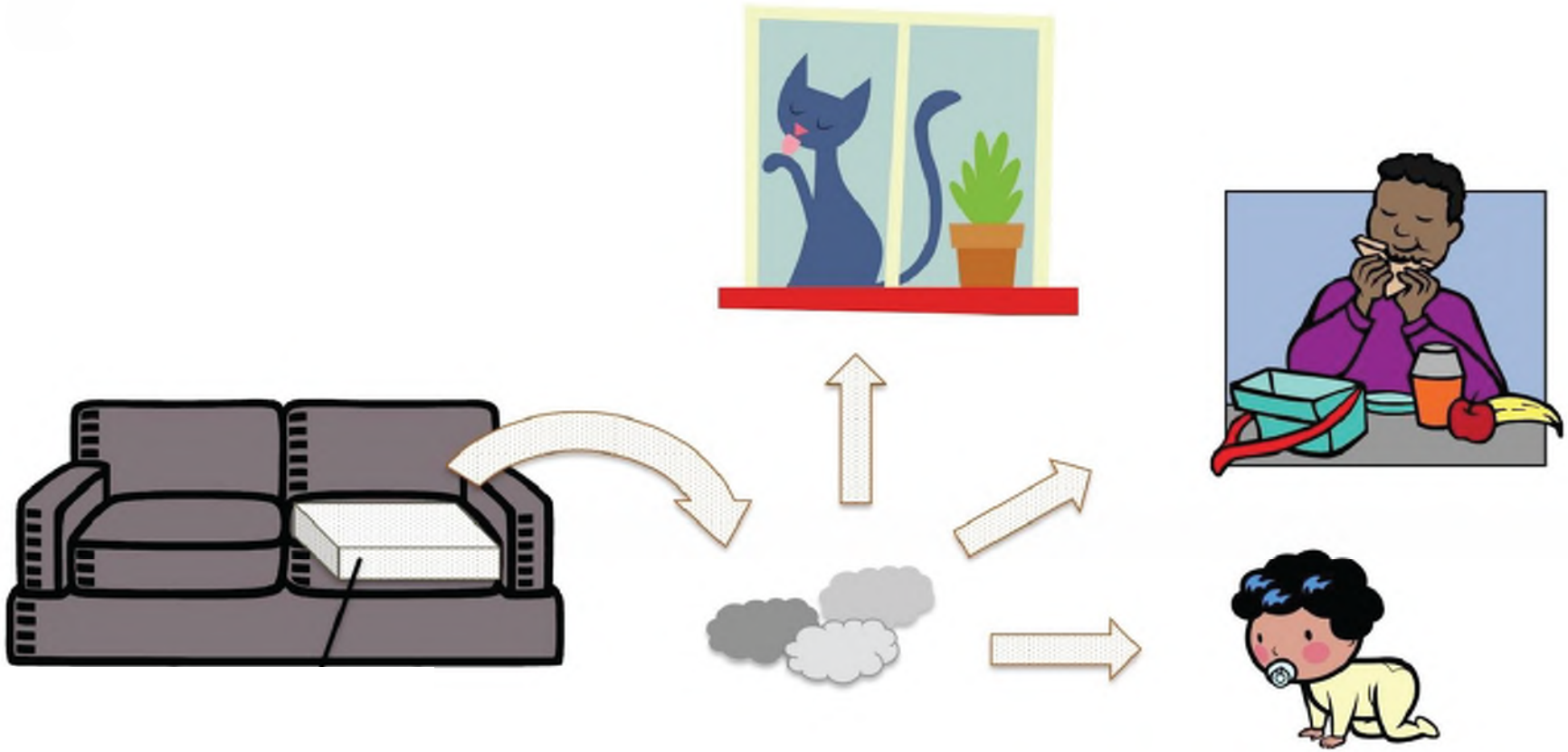
HABITABLE

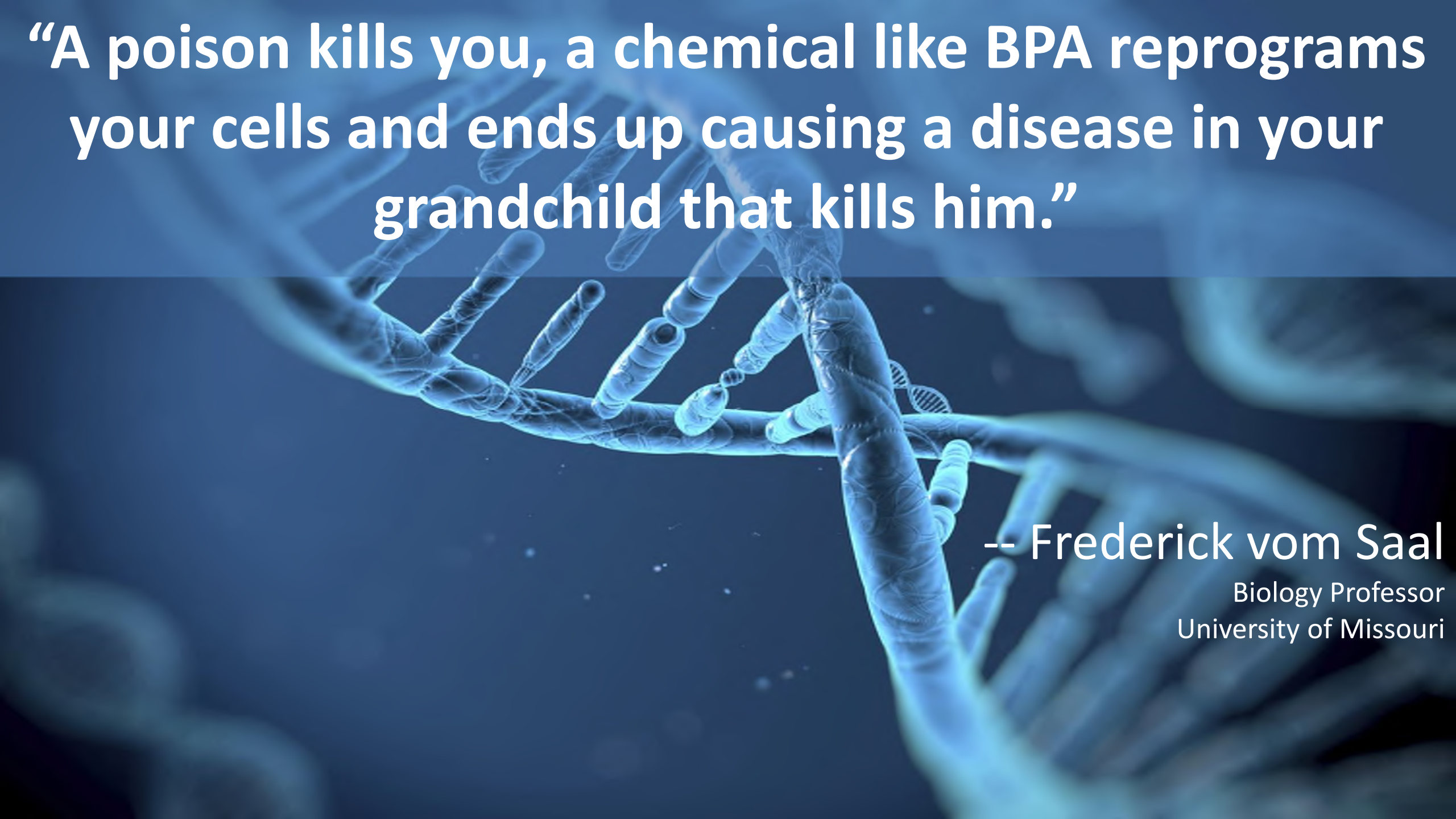
PFAS producers/
PFAS-using factories

Human exposure

Prenatal/infant
exposure

Landfill





“A poison kills you, a chemical like BPA reprograms your cells and ends up causing a disease in your grandchild that kills him.”

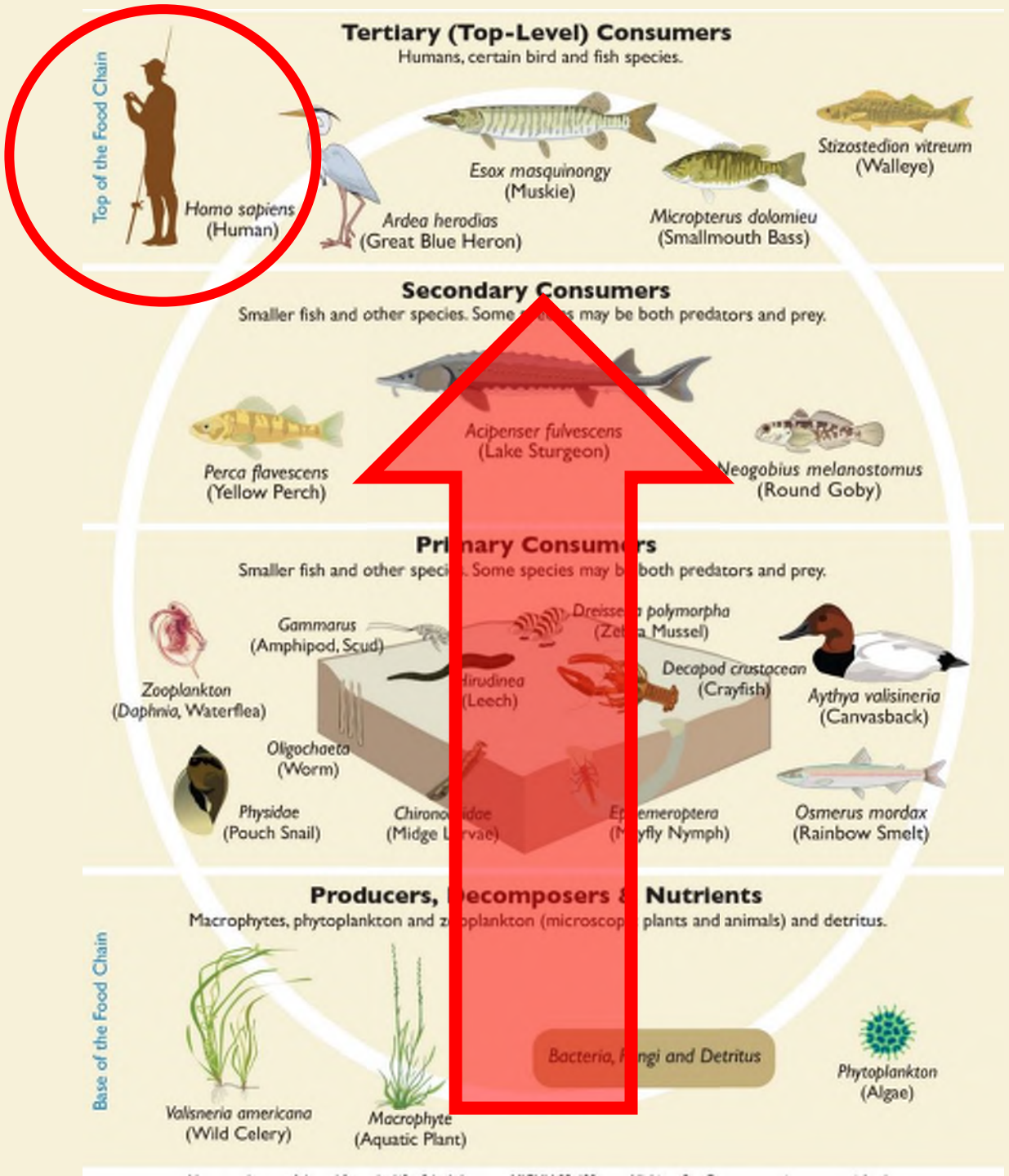
-- Frederick vom Saal

Biology Professor

University of Missouri

CRUSTACEANS, SIX MILES DEEP, WERE HIGHLY CONTAMINATED

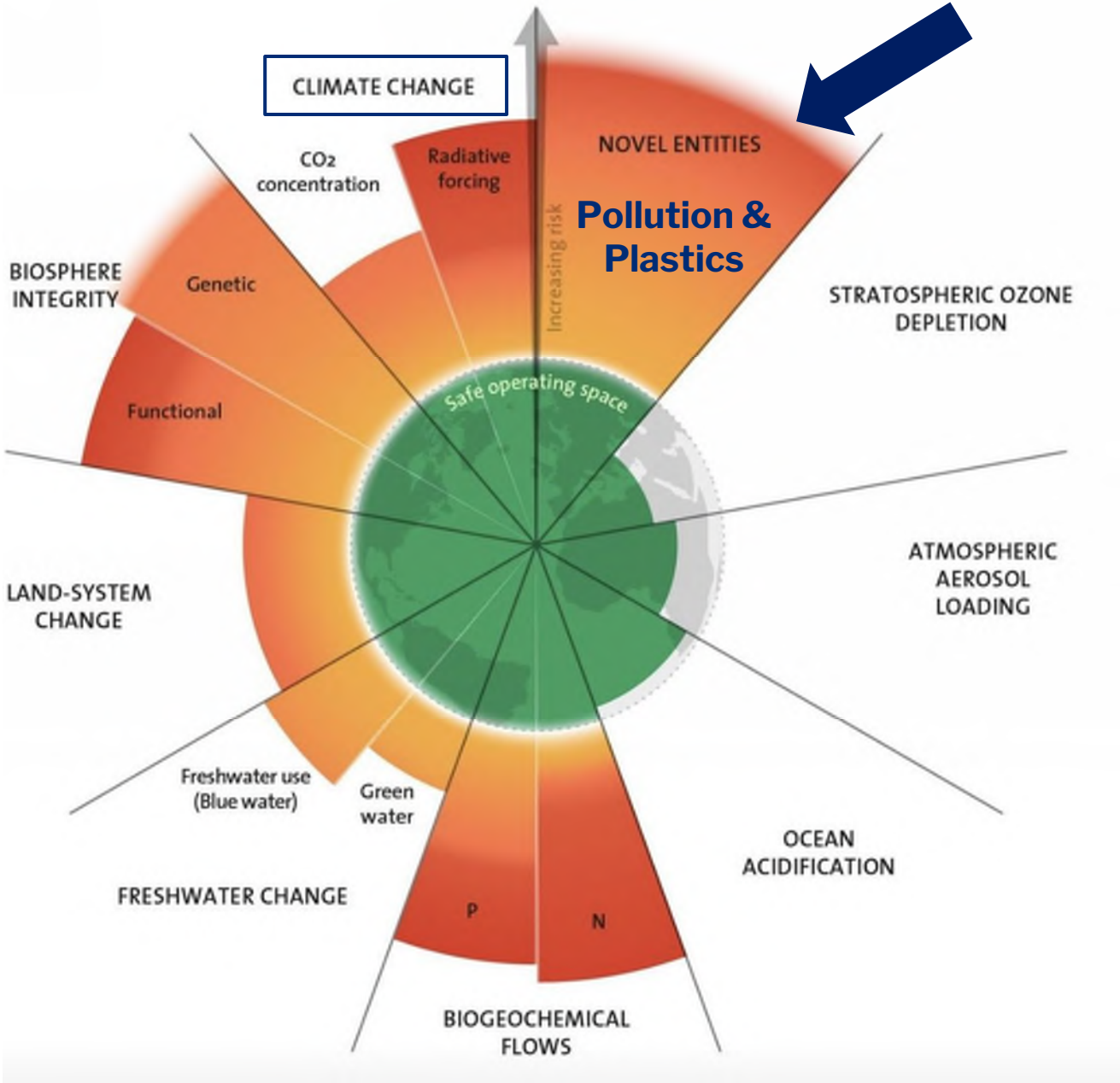
MARINE MAMMALS CONTAIN SOME OF THE HIGHEST LEVELS


Top of the Food Chain
Tertiary (Top-Level) Consumers
Humans, certain bird and fish species.
Homo sapiens
(Human)
Ardea herodias
(Great Blue Heron)
Esox masquinongy
(Muskie)
Micropterus dolomieu
(Smallmouth Bass)
Stizostedion vitreum
(Walleye)
Secondary Consumers
Smaller fish and other species. Some species may be both predators and prey.
Acipenser fulvescens
(Lake Sturgeon)
Perca flavescens
(Yellow Perch)
Neogobius melanostomus
(Round Goby)
Primary Consumers
Smaller fish and other species. Some species may be both predators and prey.
Gammarus
(Amphipod, Scud)
Zooplankton
(Daphnia, Waterflea)
Hirudinea
(Leech)
Decapod crustacean
(Crayfish)
Aythya valisineria
(Canvasback)
Oligochaeta
(Worm)
Physidae
(Pouch Snail)
Osmerus mordax
(Rainbow Smelt)
Producers, Decomposers & Nutrients
Macrophytes, phytoplankton and zooplankton (microscopic plants and animals) and detritus.
Base of the Food Chain
Valisneria americana
(Wild Celery)
Macrophyte
(Aquatic Plant)
Bacteria, Fungi and Detritus
Phytoplankton
(Algae)

9 Earth Systems

Status of Planetary Boundaries

Chemical Pollution & Plastics have crossed the planetary boundary deemed safe for humanity.

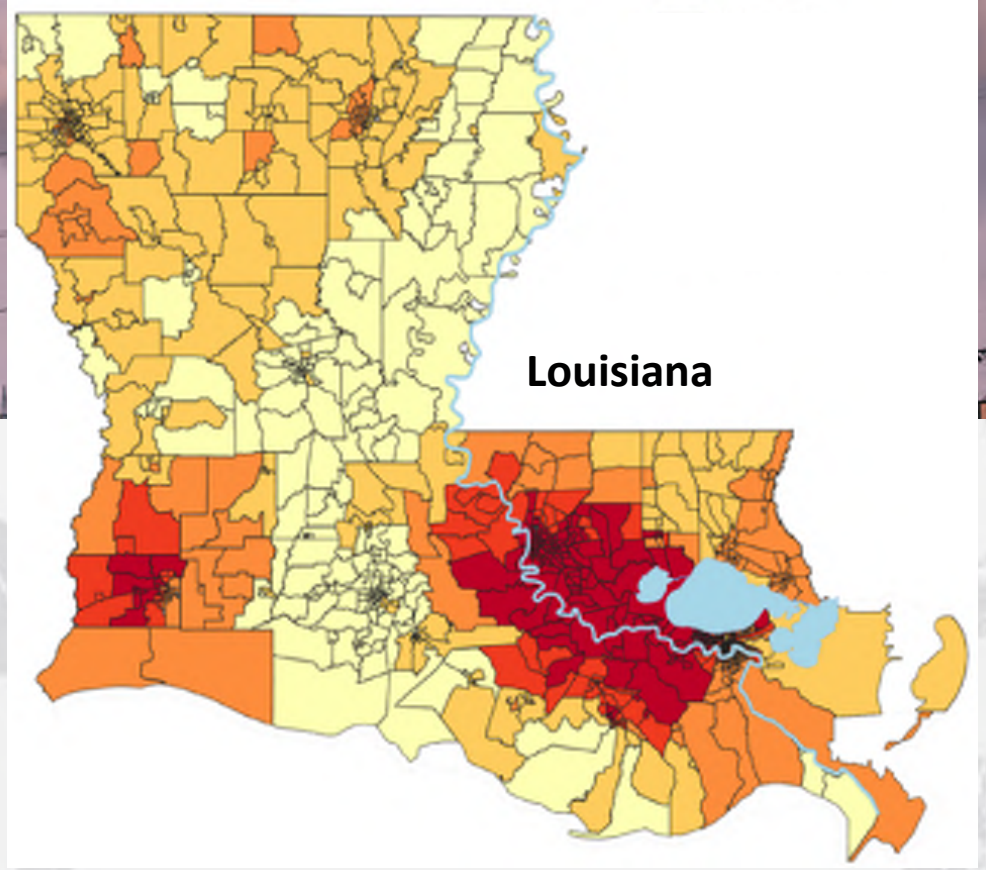


Stockholm Resilience Centre | Stockholm University

(Credit: Designed by Azote for Stockholm Resilience Centre, based on analysis in Persson et al 2022 and Steffen et al 2015)

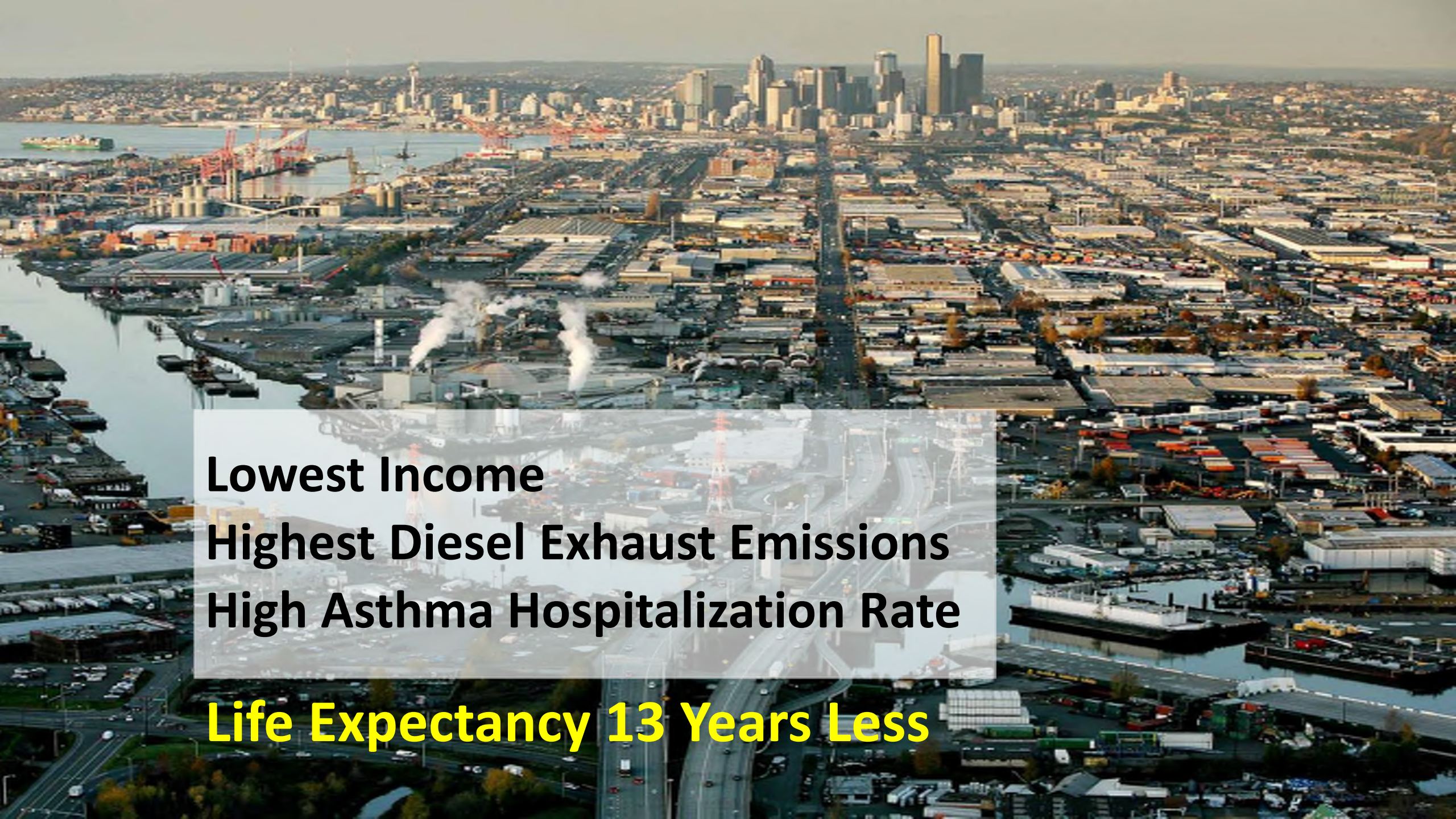

SOCIAL JUSTICE

The Cancer Corridor



Louisiana

Not All Populations Impacted Equally


Lowest Income
Highest Diesel Exhaust Emissions
High Asthma Hospitalization Rate
Life Expectancy 13 Years Less

Chemical Pollution is Global

Finite Capacity of Earth to Absorb Chemicals

Demands a Globally Coordinated Response


Take a Breath


MATERIALS ACTION
for
ARCHITECTURAL PROJECTS

AIA

Ethics

FROM THE OFFICE OF GENERAL COUNSEL

CANON VI

Obligations to the Environment

E.S. 6.3 Building Materials:
Members should select and use building materials to minimize exposure to toxins and pollutants in the environment to promote environmental and human health and to reduce waste and pollution.

DESIGN WORK

100% Regenerative Design by 2030

- Target **net positive operational energy**
- Achieve **zero embodied carbon** emissions
- Target **net positive water**
- Design for a **regenerative** site
- Prioritize holistically optimized building materials (i.e. **AIA Materials Pledge**)
- Prioritize **occupant health**
- Design for **community resilience**

Precautionary Principle

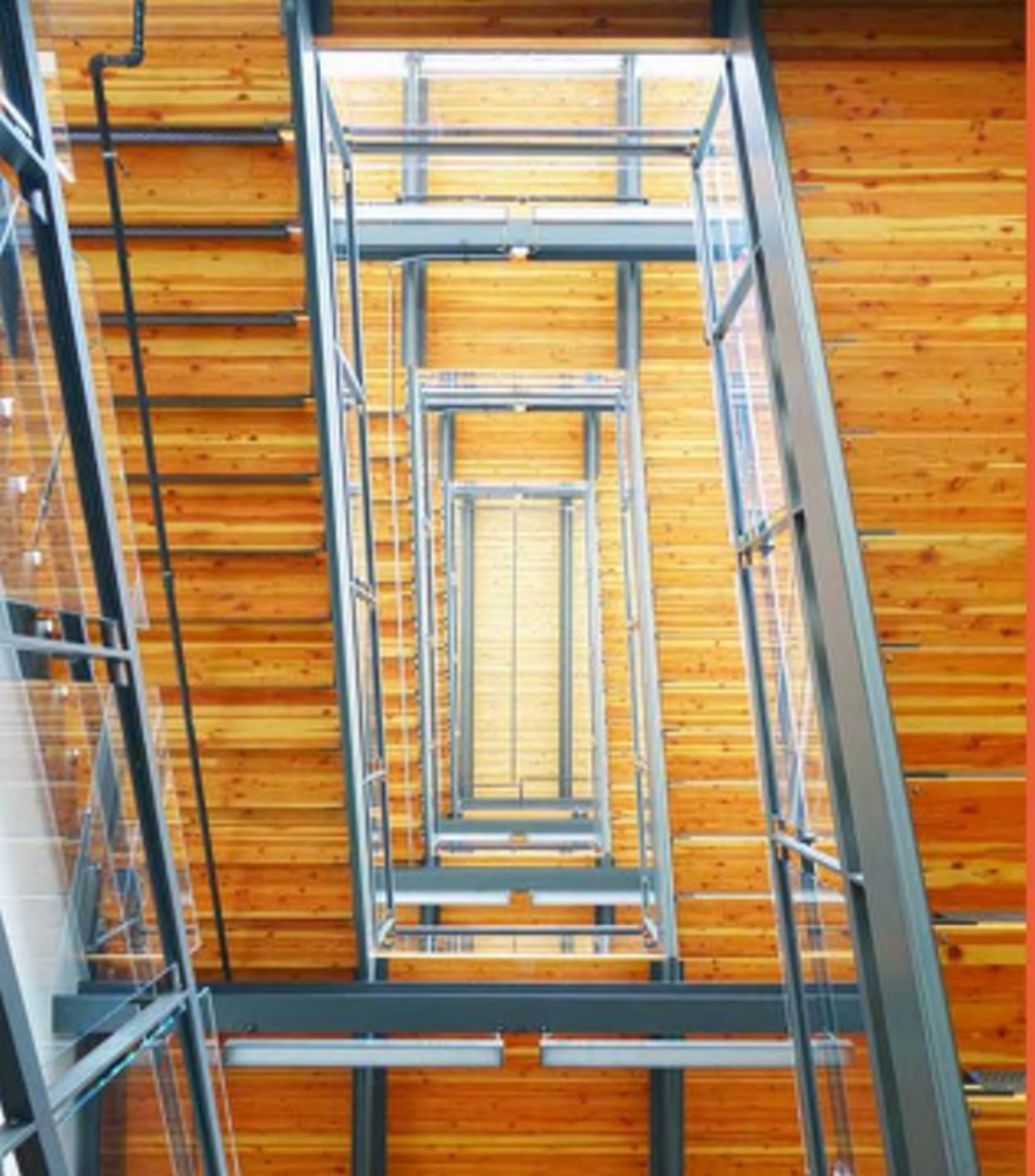
When an activity raises threats of harm to human health or the environment, **precautionary measures should be taken** even if some cause and effect relationships are **not fully established scientifically.**

--UN World Charter for Nature

Do we really need it?

Is it worth it?

Is there a safer alternative?



LIVING BUILDING CHALLENGE℠

A Visionary Path to a Regenerative Future

INTERNATIONAL LIVING FUTURE INSTITUTE™

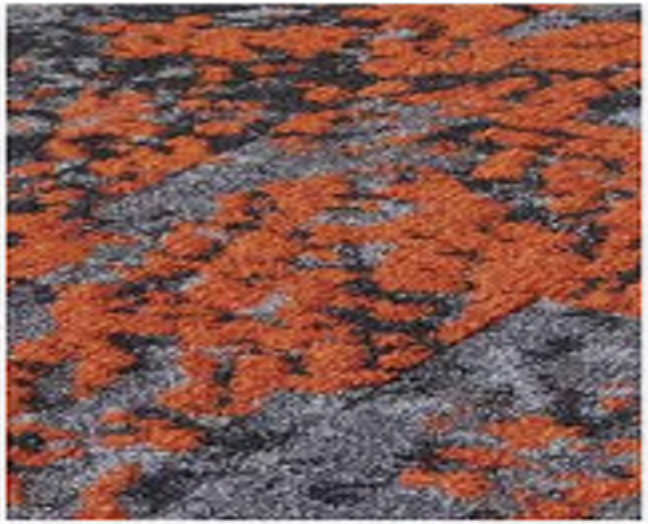
MATERIALS

Building with Products that are Safe for All Species Through Time

MATERIALS

IMPERATIVE 13

RED LIST



The intent of this Imperative is to foster a transparent materials economy free of toxins and harmful chemicals.

All projects must avoid the following Red List chemical classes in 90% of the project's new materials by cost.[32] "In situ" materials do not need to be removed or vetted for Red List chemical classes.[33]

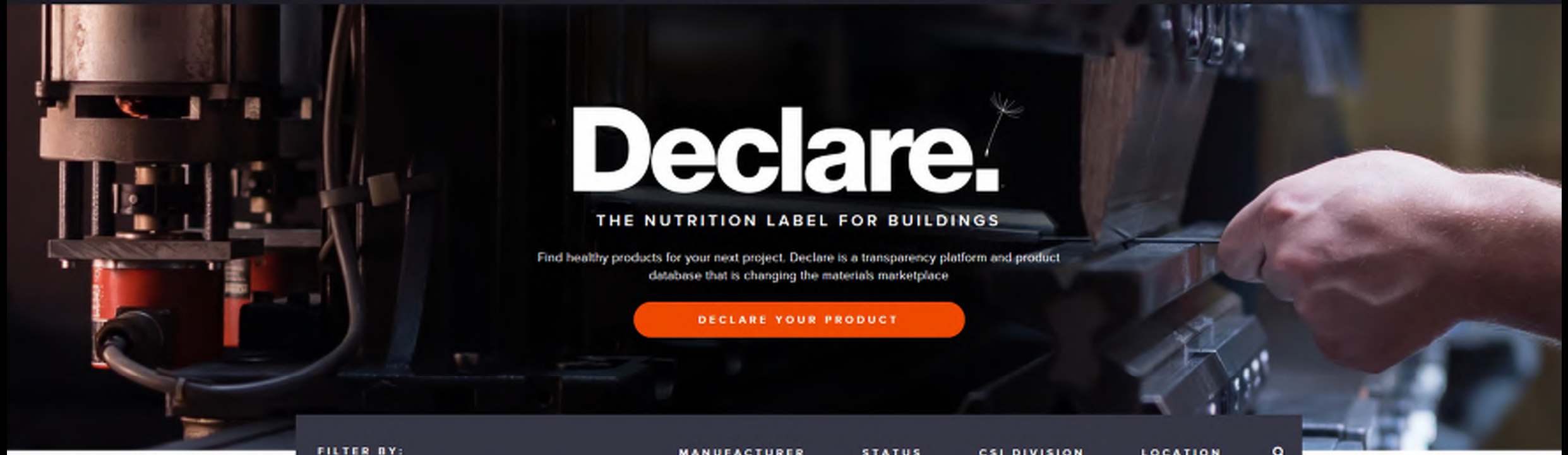
- Antimicrobials (marketed with a health claim)
- Alkylphenols and related compounds
- Asbestos compounds
- Bisphenol A (BPA) and structural analogues
- California-banned solvents
- Chlorinated Polymers, including:
  - Chlorinated polyethylene (CPE)
  - Chloroinated polyvinyl chloride (CPVC)
  - Chloroprene (neoprene monomer)
  - Chlorosulfonated polyethylene (CSPE)
  - Polyvinylidene chloride (PVDC)
  - Polyvinyl chloride (PVC)
- Chlorobenzenes
- Chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC)
- Formaldehyde (added)
- Monomeric, polymeric and organophosphate halogenated flame retardants (HFRs)
- Organotin Compounds
- Perfluorinated compounds (PFCs)
- Phthalates (orthophthalates)
- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Short-chain and medium-chain chlorinated paraffins
- Toxic heavy metals
  - Arsenic
  - Cadmium
  - Chromium
  - Lead (added)
  - Mercury
- Volatile organic compounds (VOC) (wet-applied products)*
- Wood Treatments containing creosote or pentachlorophenol

*VOCs are limited, not banned. Refer to the v4.0 Materials Petal Handbook for specific reference standard + thresholds.

32 Refer to the v4.0 Materials Petal Handbook for complete and up-to-date listings of the numerous Red List exceptions. For purposes of the Living Building Challenge, "Materials" includes systems furniture and excludes FF&E.

33 A list of CAS registry numbers that correspond with each Red List item is available and should be projects based on their date of registration. Materials deemed hazardous by a remediation professional must be addressed appropriately.


THE RED LIST
CHEMICALS OF CONCERN



Declare.

THE NUTRITION LABEL FOR BUILDINGS

Find healthy products for your next project. Declare is a transparency platform and product database that is changing the materials marketplace

DECLARE YOUR PRODUCT

FILTER BY: MANUFACTURER STATUS CSI DIVISION LOCATION

WINSTONE WALLBOARDS

10 MM GIB AQUALINE® PLASTERBOARD

9WOOD

1100 CROSS PIECE GRILLE/2100 PANELIZED LINEAR (FSC DOUGLAS...

9WOOD

1100 CROSS PIECE GRILLE/2100 PANELIZED LINEAR (FSC HEMLOCK)

WINSTONE WALLBOARDS

13 MM GIB AQUALINE® PLASTERBOARD

Health Product DECLARATION™

CONTENT INVENTORY

Threshold per material
- ○ 100 ppm
- ◉ 1,000 ppm
- ○ Per GHS SDS
- ○ Per OSHA MSDS
- ○ Other

Materials and impurities considered in 1 of 1 materials
- ◉ see Section 2: Material Notes
- ○ see Section 5: General Notes

Based on the selected Content Inventory Threshold:

Characterized..... Are the Percent Weight and Role provided for all substances?	◉ Yes ○ No
Screened..... Are all substances screened using Priority Hazard Lists with results disclosed?	◉ Yes ○ No
Identified..... Are all substances disclosed by Name (Specific or Generic) and Identifier?	◉ Yes ○ No

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

MATERIAL | SUBSTANCE | *RESIDUAL OR IMPURITY*
GREENSCREEN SCORE | HAZARD TYPE

CARPET TILE [FLY ASH LT-UNK LIMESTONE; CALCIUM CARBONATE LT-UNK BIS(2ETHYLHEXYL) TEREPHTHALATE UNK POLY(VINYL CHLORIDE-CO-METHYL ACRYLATE) LT-UNK ETHYLENE-VINYL ACETATE COPOLYMER LT-UNK POLYETHYLENE TEREPHTHALATE (PET) LT-UNK GLASS / MINERAL FIBER LT-UNK C8-18ALKYLBIS(2-HYDROXYETHYL)AMMONIUM BIS(2-ETHYLHEXYL)PHOSPHATE LT-P1 | MAM | SKI | AQU CALCIUM OXIDE LT-UNK ALCOHOL ETHOXY SULFATE UNK SOLUBLE STARCH (POLYETHYLENE-ACRYLIC ACID) COPOLYMER LT-UNK NYLON 6,6 LT-UNK NYLON 6 LT-UNK]

Number of Greenscreen BM-4/BM3 contents..... 0

Contents highest concern GreenScreen Benchmark or List translator Score..... LT-P1

Nanomaterial..... No

INVENTORY AND SCREENING NOTES:

As included in the finished Product, none of the material(s) identified with a "Hazard Type" designator have been shown to present any increased risk to human health under normal conditions of use or exposure.

VOLATILE ORGANIC COMPOUND (VOC) CONTENT

VOC Content data is not applicable for this product category.

CERTIFICATIONS AND COMPLIANCE

◉ Self-Published*
○ Third Party Verified

VERIFIER: SCREENING DATE: February 22, 2016 EXPIRY DATE*: February 22, 2019

VERIFICATION #: RELEASE DATE: February 22, 2016 * or within 3 months of significant change in product contents

*See HPDC website for details

CRADLE TO CRADLE PRODUCTS INNOVATION INSTITUTE

Material Health PLATINUM

cradle to cradle CERTIFIED PRODUCTS PROGRAM

Accoya® Wood (Radiata Pine & Alder)

ISSUED TO Accsys Technologies

STANDARD 3.1 **EXPIRES** 9 August 2019

LEAD ASSESSMENT BODY
MBDC

ASSESSED APPLICATIONS
Manufacture, Installation, Use Outdoors, Landfilling, Composting, Incineration

PRODUCTS COVERED
Accoya® Wood - Radiata Pine
Accoya® Wood - Alder

PRODUCT OPTIMIZATION SUMMARY

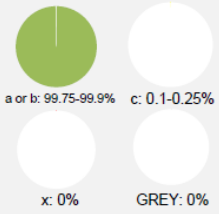
- ☑ *Cradle to Cradle Certified*™ Banned List compliant
- ☑ Material Health optimization strategy not required
- ☑ No exposure from carcinogens, mutagens, or reproductive toxicants
- ☑ VOC emissions testing not required for this product type
- ☑ Product is fully optimized - does not contain any GREY or x-assessed chemicals
- ☑ Process chemicals have been identified and none are GREY or x-assessed

PERCENTAGE OF CHEMICAL SUBSTANCES ASSESSED BY WEIGHT

100%

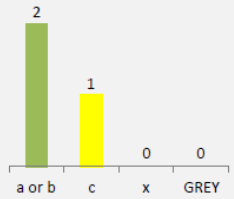
Inventory threshold for chemicals in each material = 100 ppm

ASSESSMENT RATINGS BY WEIGHT



% CHEMICAL SUBSTANCES

PRODUCT OPTIMIZATION



3 CHEMICAL SUBSTANCES

Health Profile

An aggregation of potential health hazards, represented by % of total product weight, as reported by a health hazard screening process. This does no factor in an exposure or risk assessment. See Methodology for more details on health hazard screening.

Cancer 0.23% from 1 substance	Cancer (occupational) 0.28% from 1 substance	Developmental 0.23% from 1 substance	Reproductive 0.23% from 1 substance	Cancer 1.42% from 1 substance	Developmental 0.01% from 1 substance	Eye Irritation 0.01% from 1 substance
Mammalian 0.28% from 1 substance	Organ Toxicant 0.25% from 2 substances	Respiratory (occupational) 2.81% from 1 substance	Skin Sensitization 0.01% from 1 substance	Unknown 2.22% from 1 substance		

Bisphenol A (BPA)

CASRN: 80-05-7

Building Products

Where it's Commonly Found

BUILDING PRODUCT	MASTER SPEC SECTIONS
Epoxy Grouting	09 30 00 — Tiling 09 30 13 — Thin-Set Ceramic Tiling 09 31 00 — Thin-Set Tiling 09 31 33 — Thin-Set Stone Tiling
Epoxy Paint or Epoxy Coatings	09 91 00 — Painting 09 96 00 — High Performance Coatings 09 96 56 — Epoxy Coatings
Epoxy Resinous Flooring	09 67 00 — Fluid-Applied Flooring 09 67 23 — Resinous & Epoxy Resinous Flooring
Fluid-Applied Flooring	09 67 00 — Fluid-Applied Flooring 09 67 23 — Resinous & Epoxy Resinous Flooring 09 67 25 — Troweled Resinous Flooring
High Pressure Laminate	06 41 00 — Architectural Wood Casework 06 41 16 — Plastic-Laminate Clad Architectural Cabinets 06 42 19 — Plastic-Laminate Faced Wood Paneling

INFORMED
HABITABLE


Flooring


Paint


Drywall


Countertops


Cabinetry & Millwork


Doors


Insulation


Flooring Installation


Sealants


Turf


Water Pipes


Roofing


Waterproofing & Dampproofing


Fire Protection

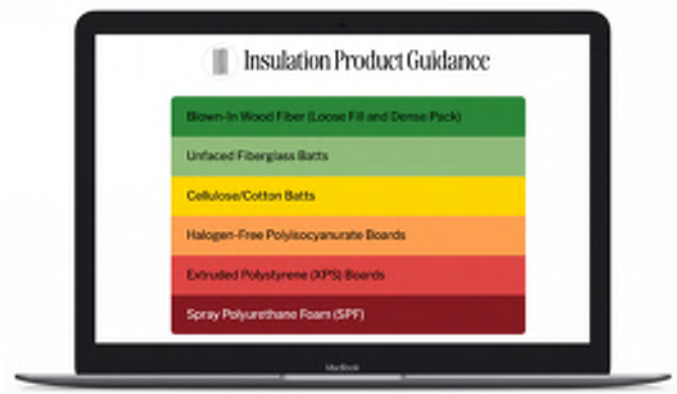

Firestopping & Fireblocking


Acoustical Ceilings & Treatments


Window Frames


Exterior Cladding & Siding

- Best in Class
- Better
- Good
- Reduce
- Eliminate
- Worst in Class



Resilient Flooring

Hazard Spectrum

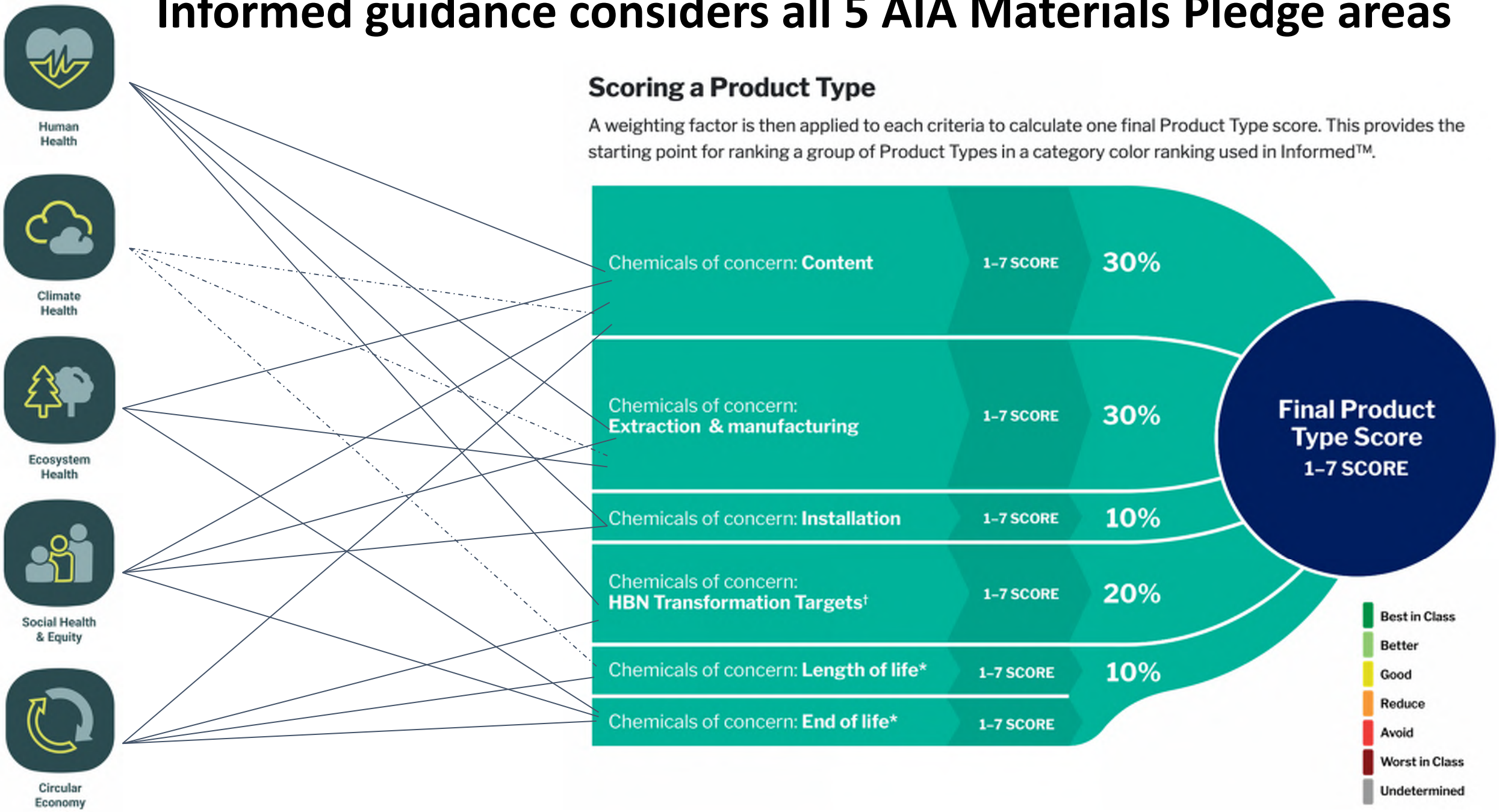
- Linoleum
- Solid Wood Floors (pre-finished)
- Concrete (no finish/accessories or only densifier without PFAS)
- Ceramic Tiles (made in the USA/lead-free with no CRT content)
- Solid Wood Floors (site-finished)
- Cork Floors (pre-finished)
- PVC-free Resilient Flooring
- Engineered Wood Floors (pre-finished)
- 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)
- Vinyl Floors (no phthalates or hazardous recycled content)
- Ceramic Tiles (not made in the USA/presence of lead is unknown/CRT tiles)
- Concrete (with sealers or with densifiers/coatings containing PFAS)
- 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)

USE

AVOID

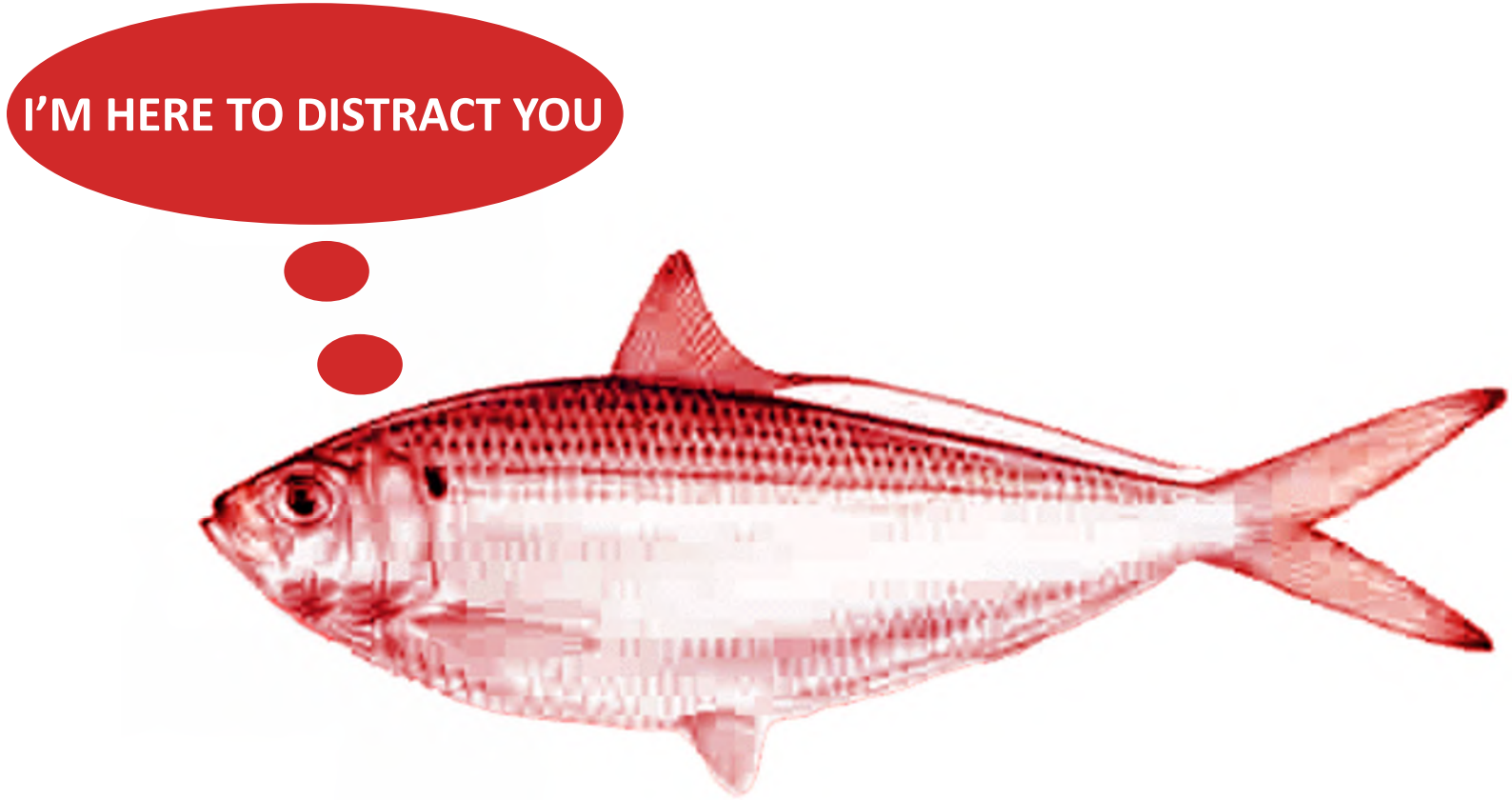
INFORMED

Informed guidance considers all 5 AIA Materials Pledge areas



- Trust their disclosed data
- Consider claims / explanations with caution

Manufacturers As Partners



"Encapsulated"

"Not Present in End Product"

Instead: Consider Full Life Cycle Effects


REGULATORY ACTION

Pollution Prevention for our Future Act

- Nation’s strongest legislation regulating harmful building and consumer chemicals
- Directs state agencies to address **classes** of chemicals
- Department of Ecology has authority to ban or restrict chemicals
- Establishes timelines for oversight and increased action every 5 years

PFAS Regulation

In January 2024, the EPA finalized a rule that prevents companies from manufacturing or processing PFAS without an EPA review and risk determination

In February 2024, the FDA announced that manufacturers are no longer selling grease-proofing substances containing PFAS for food contact use in the US

In April 2024, the EPA established the first legally enforceable national drinking water standard for PFAS, setting limits for six PFAS compounds.

The **Restriction of Hazardous Substances (RoHS)** Directive is a European Union regulation aimed at reducing the environmental and health impacts of electronic and electrical equipment by restricting the use of certain hazardous substances.

10 Restricted Substances:

Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr VI)
Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)
	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)	

Compliance: Products must comply with RoHS to be sold in the EU market. This includes meeting maximum concentration values for the restricted substances and ensuring proper labeling and documentation.

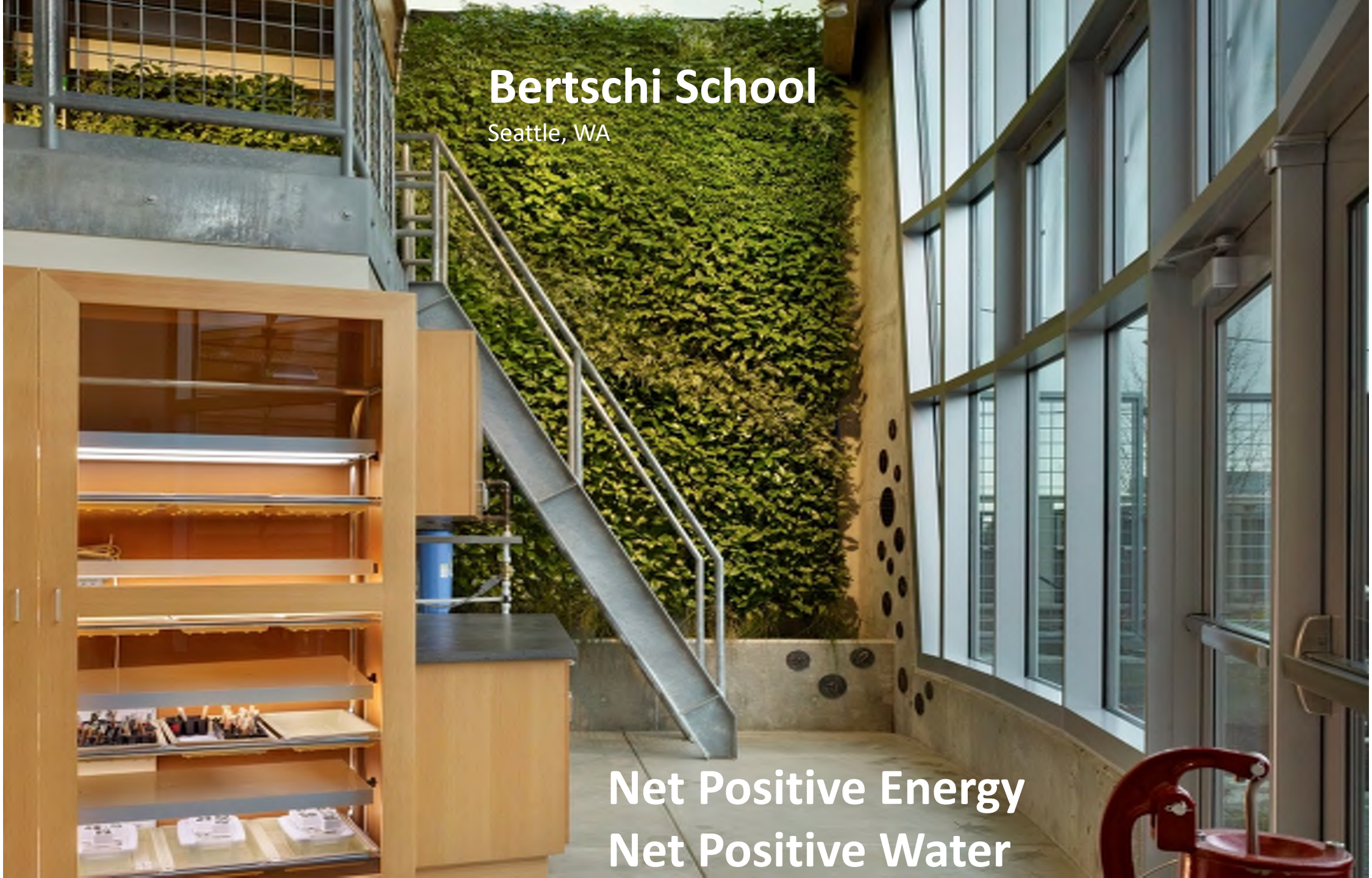
Purpose: REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) aims to **protect human health and the environment** from risks posed by chemicals, while enhancing the competitiveness of the EU chemicals industry.

- **Scope**: It applies to **all chemical substances** used in industrial processes and daily life, such as cleaning products, paints, and articles like clothes and furniture.

- **Responsibilities**: Companies must **identify and manage risks** associated with the substances they manufacture and market in the EU. They need to demonstrate safe usage and communicate risk management measures.

- **Regulation**: REACH shifts the burden of proof from public authorities to industry, requiring companies to register substances and work together to assess and manage risks


EXAMPLE PROJECTS


Bertschi School
Seattle, WA
Net Positive Energy
Net Positive Water

Bullitt Center

Seattle, WA

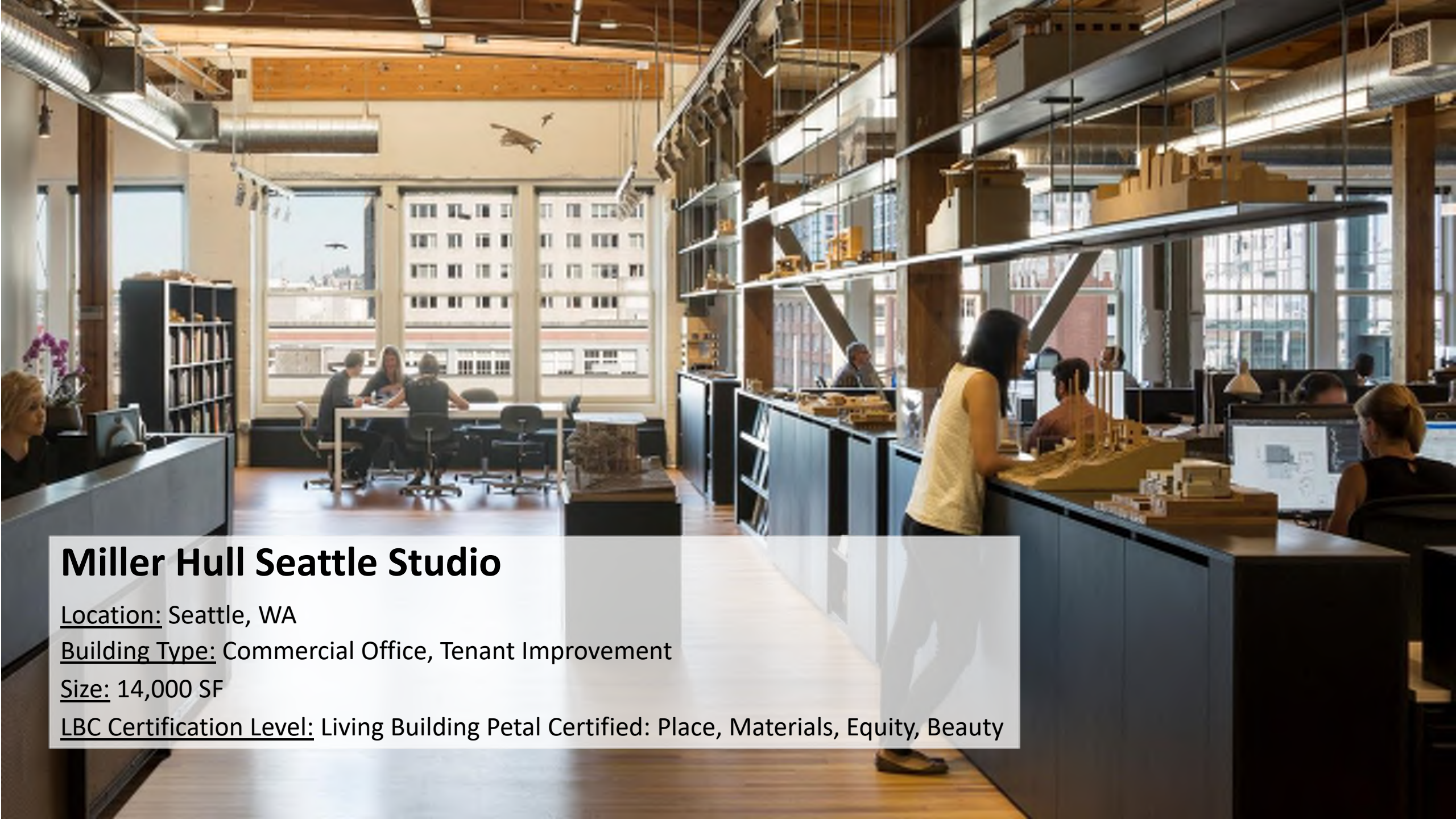
Net Positive Energy
Net Positive Water

Kendeda Building

Atlanta, GA

Net Positive Energy

Net Positive Water



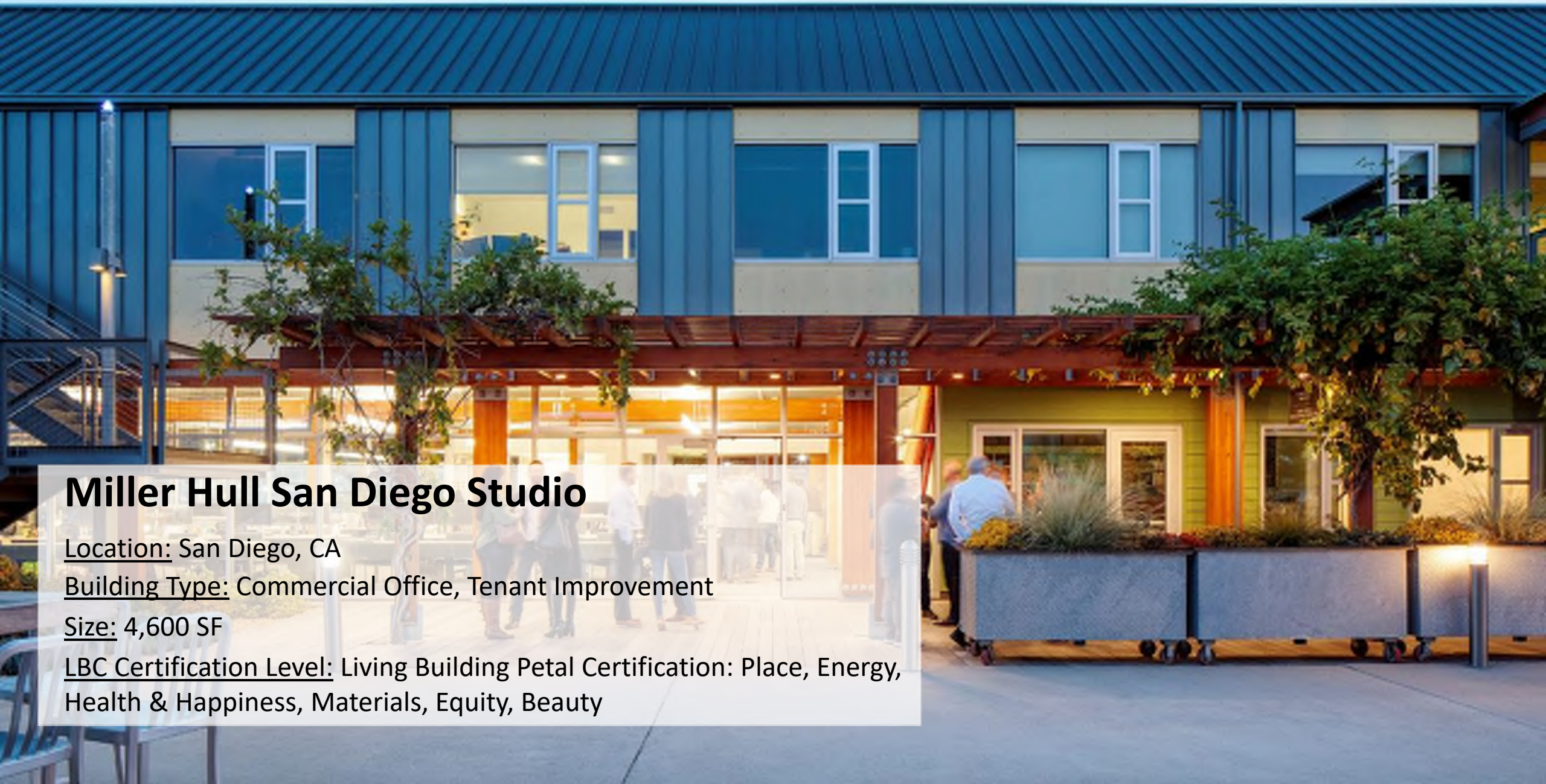
Miller Hull Seattle Studio

Location: Seattle, WA

Building Type: Commercial Office, Tenant Improvement

Size: 14,000 SF

LBC Certification Level: Living Building Petal Certified: Place, Materials, Equity, Beauty



Miller Hull San Diego Studio

Location: San Diego, CA

Building Type: Commercial Office, Tenant Improvement

Size: 4,600 SF

LBC Certification Level: Living Building Petal Certification: Place, Energy, Health & Happiness, Materials, Equity, Beauty

Loom House

Location: Bainbridge Island, WA

Building Type: Single Family Residential, Renovation

Size: 3,400 SF

LBC Certification Level: Full Living Certified

University of Washington Hans Rosling

Location: Seattle, WA
Type: Higher Education
Size: 300,000 SF
Certification: LEED Platinum and Fitwel

Deschutes Public Library, Redmond

Location: Redmond, OR
Type: Civic
Size: 38,000 SF
Certification: LEED (Pending)

Newhouse Replacement Building

Location: Olympia, WA; Capitol Campus
Type: Civic, Office
Size: 59,300 SF
Certification: LEED Platinum

Image Credit: © Lara Swimmer/Esto

Review:
What Can You Do?

- Set Goals
- Prioritize
- Educate
- Advocate
- Use The Tools
- Make This Your Standard Process
- Do We Really Need It?

THANK YOU

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