Chemical and environmental justice impacts along product life cycles

Building Insulation Case Studies

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Trail map

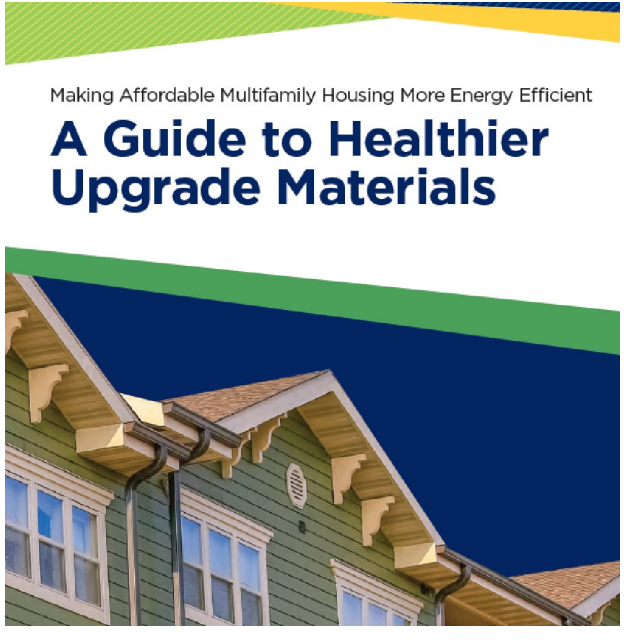
- About NRDC
- Overview of project
- Case study findings

Natural Resources Defense Council

MISSION STATEMENT

To safeguard the Earth: its people, its plants and animals and the natural systems on which all life depends.

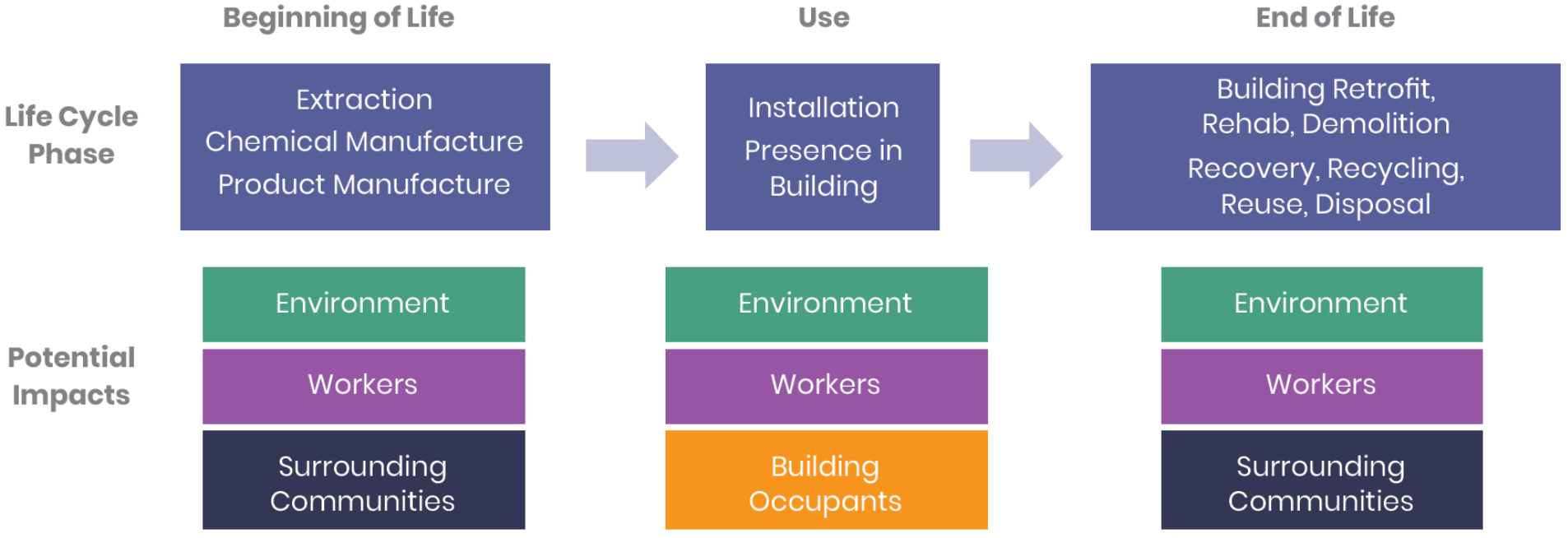
Previous work: spray foam insulation poorest health hazard ranking



Insulation material	Highest concern chemicals
Fiber glass	
Cellulose	
Mineral wool	Formaldehyde
Polyiso and EPS	Flame retardants
XPS	Flame retardants
Spray foam	Isocyanates Flame retardants

ENERGY EFFICIENCY FOR ALL

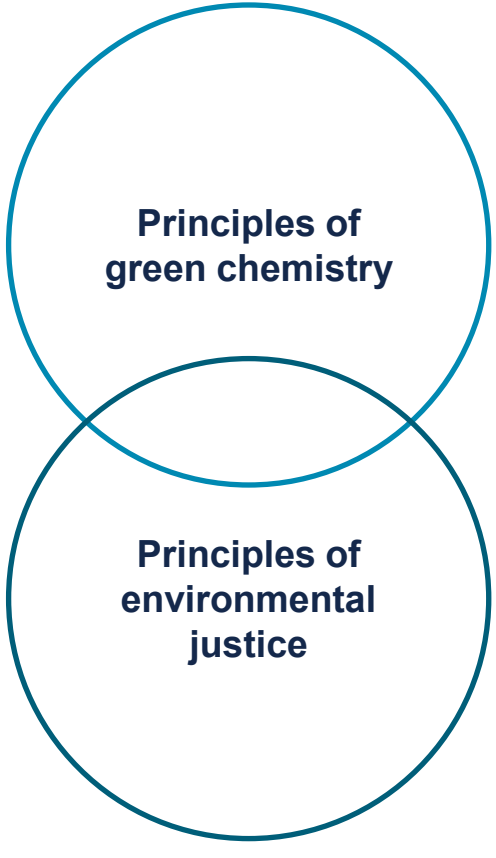
Chemicals in building materials have life cycle impacts



2 case studies

Spray foam – **Isocyanates (MDI)** | Fiberglass- **Glass fibers**

Framework for case studies



Criteria for research and analysis

Principles of Green Chemistry

Principles of Environmental Justice

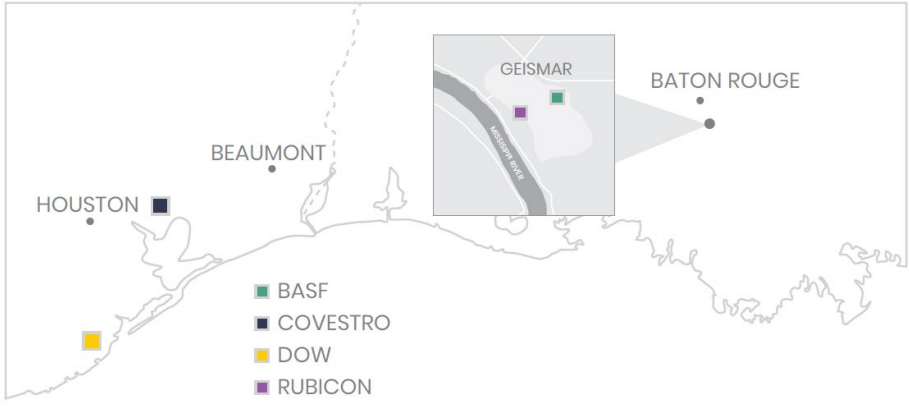
"universal protection from toxics for all peoples"

Main steps to evaluate impacts

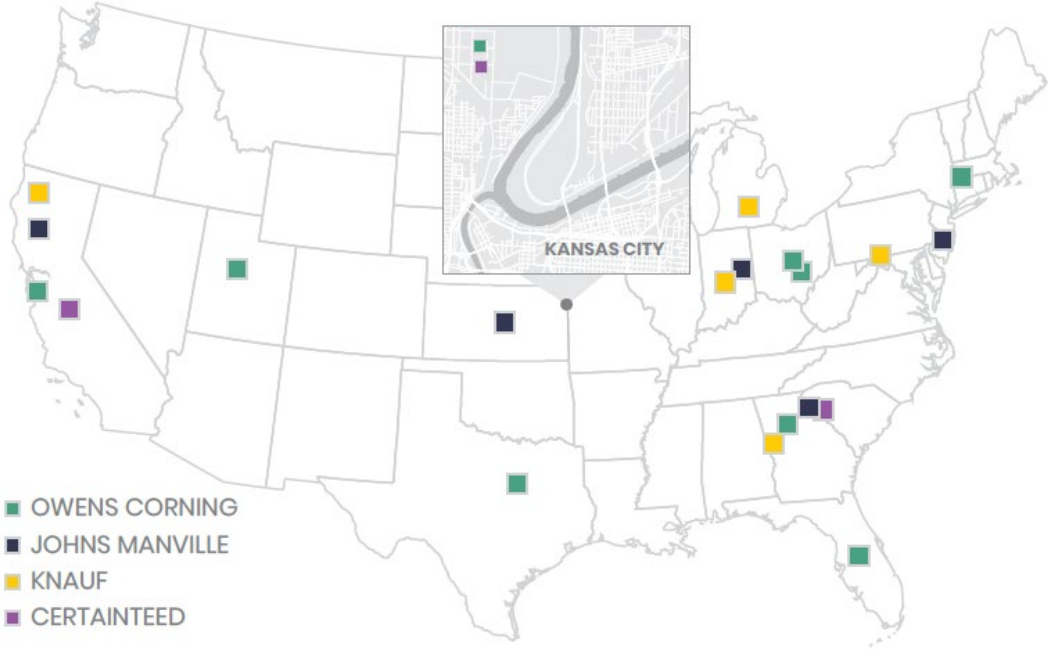
- Identify manufacturing facilities
- Identify key chemical inputs to make isocyanate or glass fiber
- Data on facility emissions and waste
- Site analysis- demographics, cumulative impacts

Identified manufacturing facilities

Isocyanates



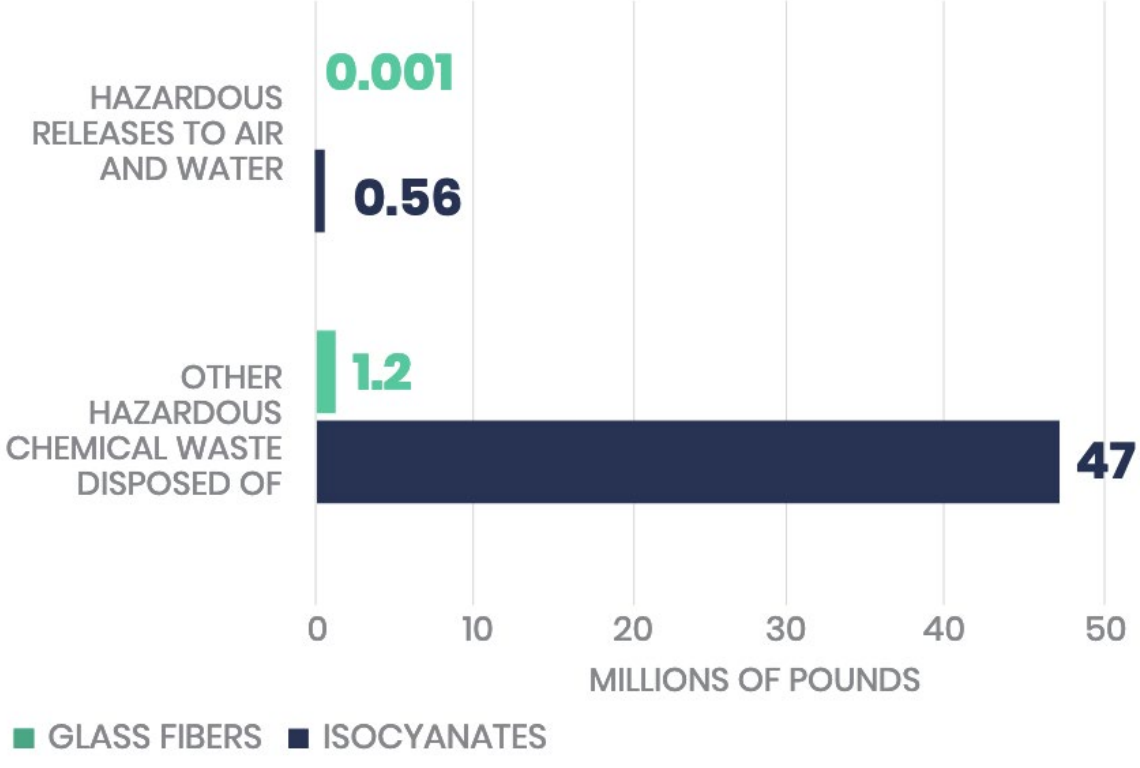
Glass fibers



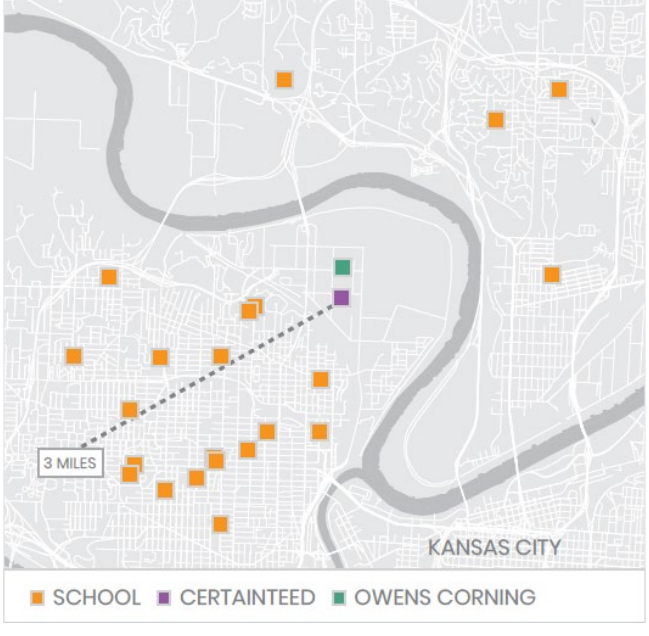
Key chemical inputs hazards

	MDI	Glass fibers
Hazardous to human health- inputs	**>90%**	~35%
Highly reactive/ flammable- inputs	**50%**	<10%
Volatile- inputs	**>90%**	0%
Is main ingredient hazardous?	**MDI- Yes**	Glass fibers- No

Preventing pollution and waste



Concerns for children's health



Facility and Location	Rubicon Geismar, LA	BASF Geismar, LA	Dow Freeport, TX	Covestro Baytown, TX	U.S. Overall
Population	1,463	1,462	13,220	23,889	322,903,030
Under 18 Years Old	30%	30%	34%	29%	23%
Number of Schools	0	0	6	4	

Environmental justice considerations

	MDI facilities	Glass fiber facilities
Facilities abide by environmental regs	**50% significant violations all last 12 quarters**	14% significant violations all last 12 quarters
Accidents	**Worker injuries, shelter in place orders**	None found
Disproportionately impact marginalized populations	**~59% people of color in fenceline** (39% U.S)	**~45% people of color in fenceline** (39% U.S.)
Cumulative impacts	**All MDI facilities sited in cities with 18-29 hazardous release facilities. ~4-15 million pounds annual releases**	Variable- some facilities sited with other hazardous release facilities, others not. 1 pound -1.2 million pounds annual releases

Summary and next steps

- Publicly available data allow assessment of life cycle localized impacts
- Both materials generate toxic emissions and hazardous waste that disproportionately impact marginalized communities
- Glass fibers perform comparatively better
- Limitations in available data – possible over- and under- estimates of hazardous releases
- Case studies and report brief available!

Thank you!

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