

LDAR and ELP, Environmental Justice

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Tricord Consulting, LLC

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Leak Detection and Repair (LDAR)

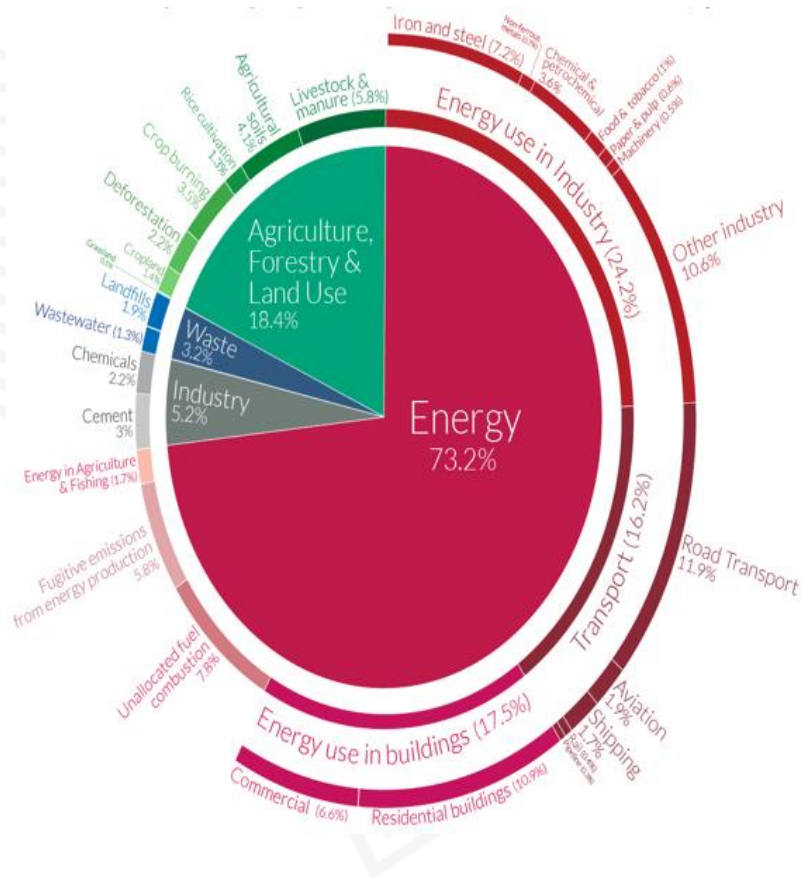
- 1950's – Concern of Smog in LA, study linked VOC fugitives to main SMOG contributor
- 1970s & 80s – Research on Refineries and Chemical Plants
 - METHOD 21 Promulgated by EPA
- 2015 – The Paris Agreement: Goal Net Zero by 2050
- 2019 – The Climate Pledge: Goal Net Zero by 2040

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World GHG Sources

2022



Sources of GHGs - ~49 B metric tons (MT)

~73% - Energy Use (~36 B MT)

- 31% - Heat / Elect (~15 B MT)
- 16% - From Transport (~8 B MT)
- 12 % - Industry (~6 B MT)
- 6% - Residential / Commercial (~3 MT)
- **6% - Fugitives (~3 B MT)**
- 2% - Other combustion (~1 B MT)

~19% - Agriculture, Land Use (~9 B MT)

~5% - Industry (~3 B MT)

~3% - Waste (~1 B MT)

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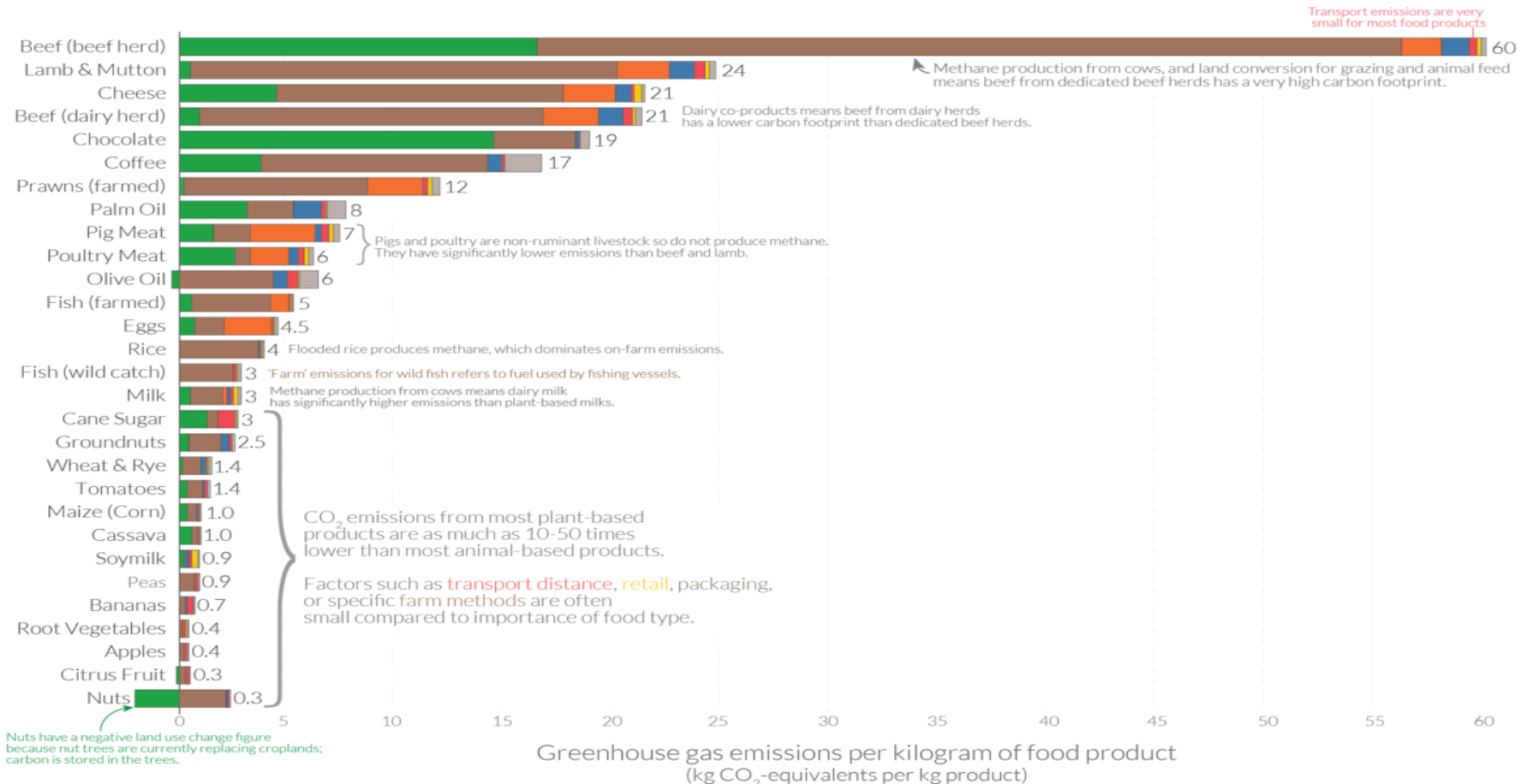
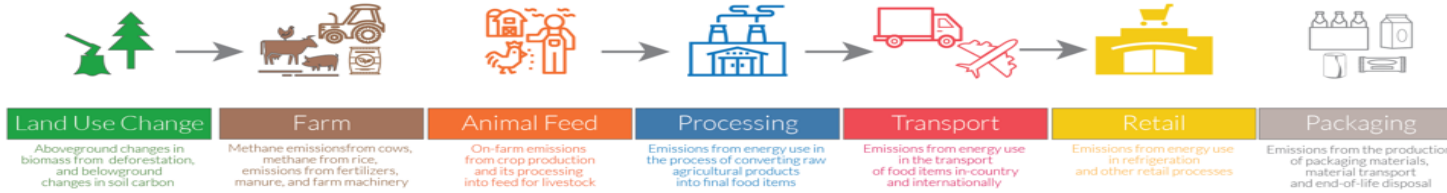


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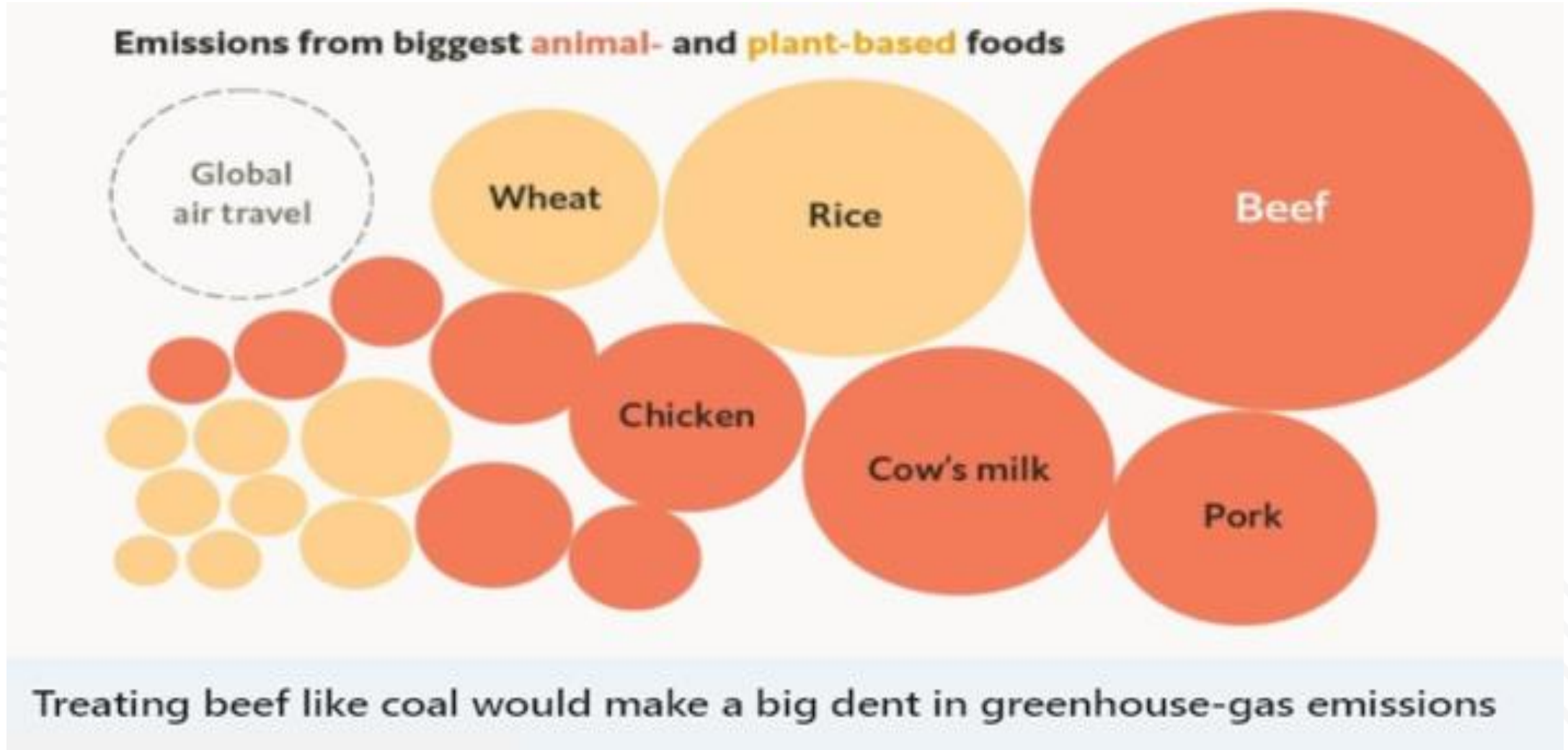
Agriculture – ~19% of World GHGs

Food: greenhouse gas emissions across the supply chain

Our World
in Data



Agriculture – ~19% of World GHGs



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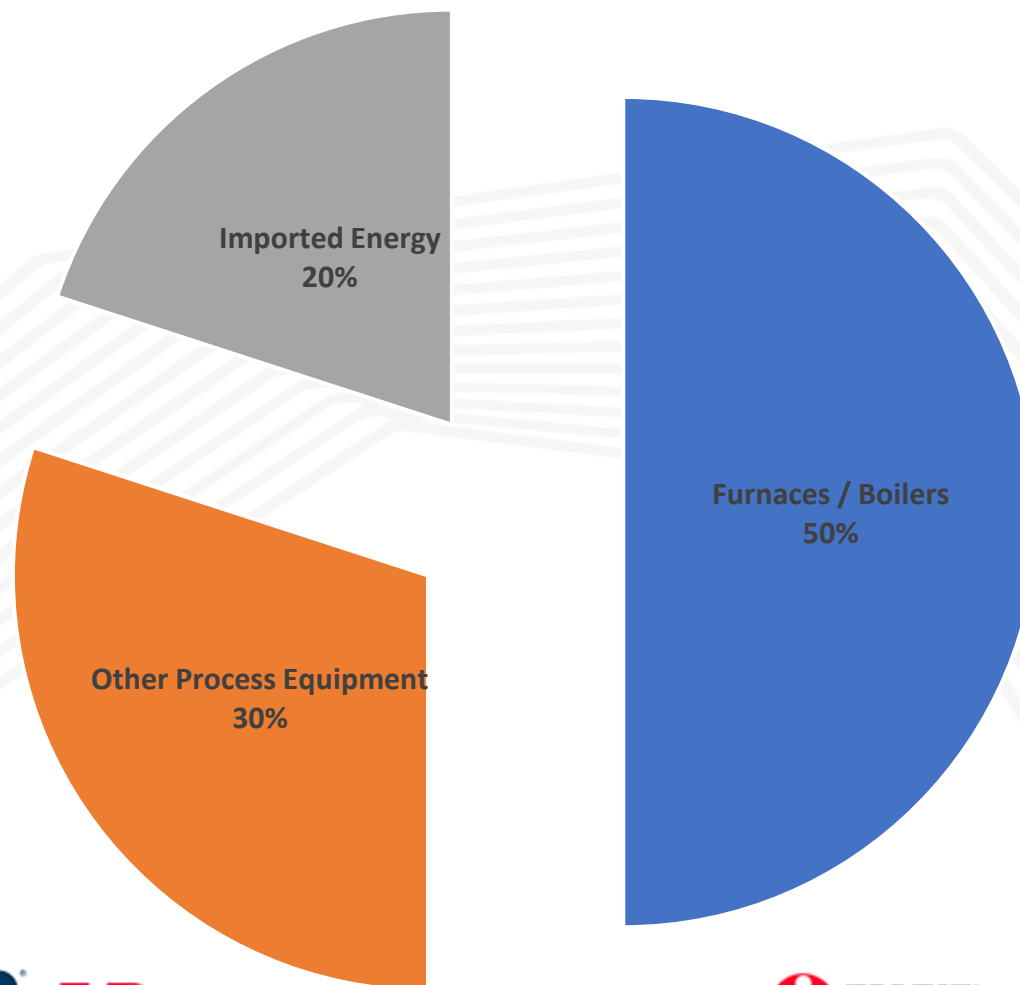
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Industry / Manufacturing – ~12% of World GHGs **2022**

Industry Example - Source of GHGs



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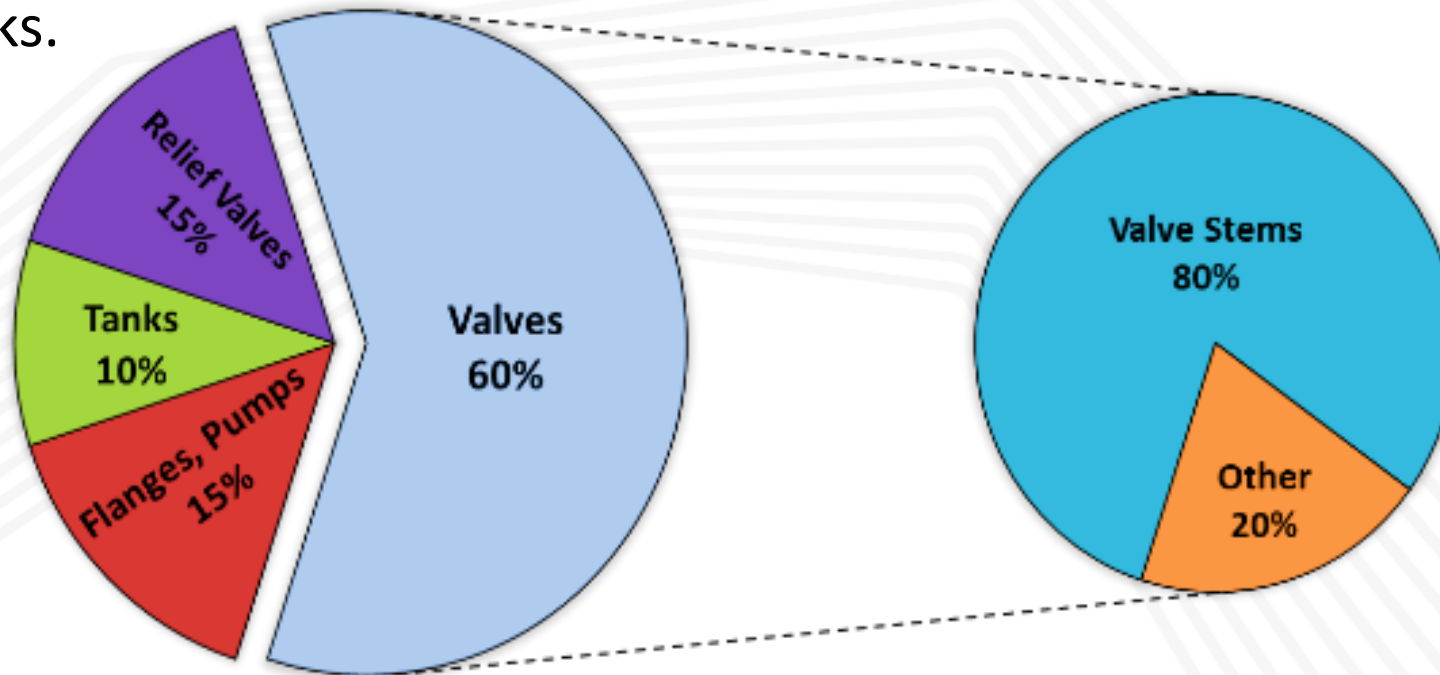


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Leak Detection and Repair (LDAR)

- Sources of Leaks

- EPA estimates 70,000 tpy of VOC and ~10,000 tpy of HAP are emitted from equipment leaks.



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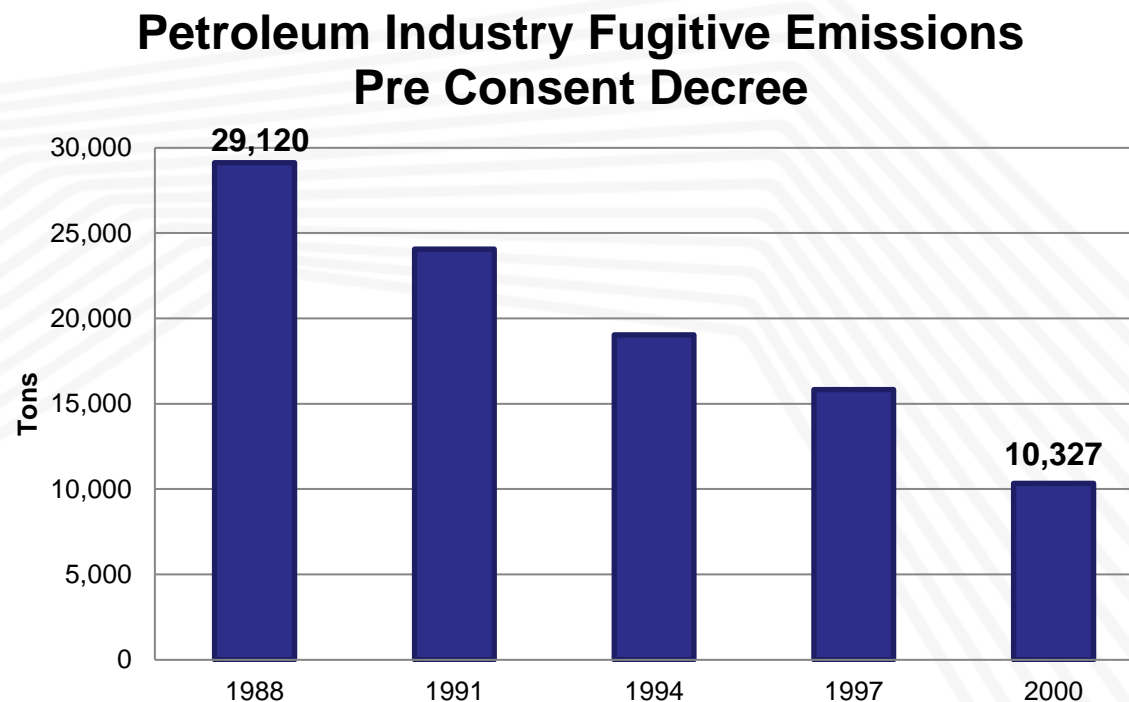
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Leak Detection and Repair (LDAR)

- Clean Air Act – LDAR 1980s to Pre-Consent Decree (CD)



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Leak Detection and Repair (LDAR)

- 1st Round CDs – Focus on Petroleum Industry
 - Introduction to Enhanced LDAR Programs (ELPs)
 - Progression of time brought in Certified Low Leaking Technology (CLLT)

Acceptable Criteria for Low-E Valves and Packing

1. Manufacturers warranty (≤ 100 ppm for 5 years)
 - a) Tested by manufacturer or qualified testing firm pursuant to generally-accepted good engineering practices for testing FE.
 - b) “Extensions” of valves can be qualified as Low-E (e.g. same pressure and temperature rating)
2. Tested to show, at no time leaked ≥ 500 ppm, and on average, leaked at ≤ 100 ppm

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Enhanced LDAR Programs (ELP)

2022

- Initial Additional Cost Estimates for ELP Enhancements

Plant Size	Large	Average	Small
Number of Components	300,000	81000	5000
Number of DOR Components	250	77	38
Number of Chronic Leakers 10,000 ppmv	41	12	2
Number of New Installed Valves	500	200	50
Total of CLLT Applicable Inventory	1150	628	338
Percent of Repacking	25%	25%	25%
Percent of Replacement	74%	74%	74%
Commercially Unavailable	1%	1%	1%
Cost of Low-E Packing Based off repacking valves in the field	\$560.00	\$200.00	\$65.00
Cost of Low-E Valve Replacement Based off of repacking what is in stock	\$1,650.00	\$600.00	\$200.00
Procurement Cost	\$90,000.00	\$50,000.00	\$10,000.00
Warehousing	\$16,00.00	\$10,000.00	\$4,000.00
MOC	\$8,000.00	\$5,000.00	\$2,000.00
Capital Projects	\$8,000.00	\$5,000.00	\$2,000.00
Engineering/Design	\$40,000.00	\$25,000.00	\$10,000.00
Tracking CLLT	\$52,000.00	\$35,000.00	\$18,000.00
Estimated Additional Cost for CLLT	\$ 3,500,000.00	\$ 2,250,000.00	\$ 1,250,000.00

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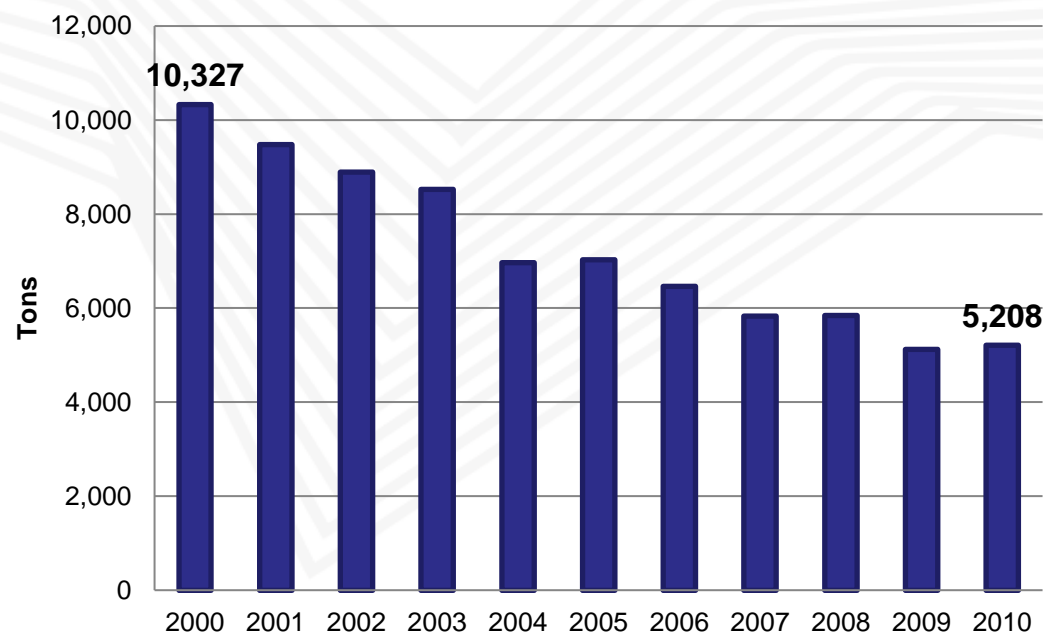
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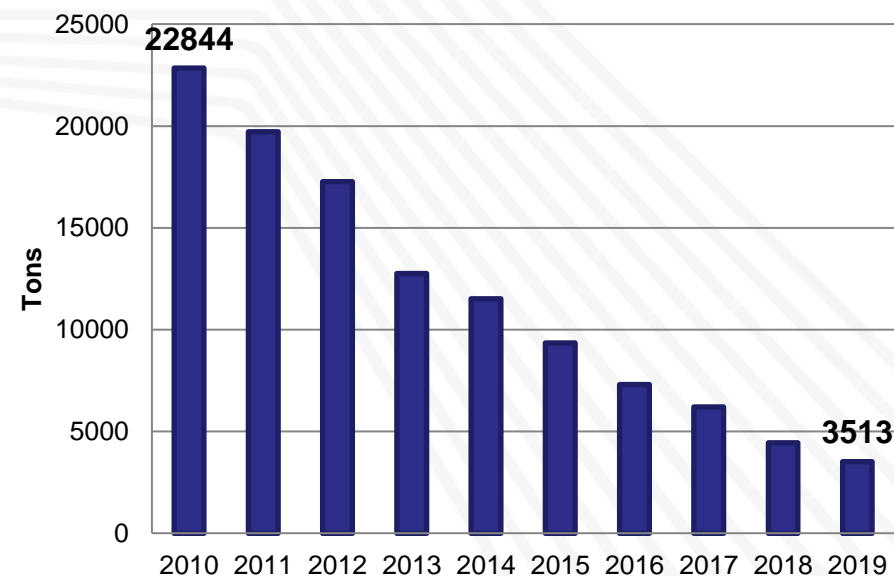
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- Clean Air Act – CD to Present

Petroleum Industry Fugitive Emissions Post Consent Decree



Chemical Industry Fugitive Emissions Over 9 Years While Implementing Consent Decrees



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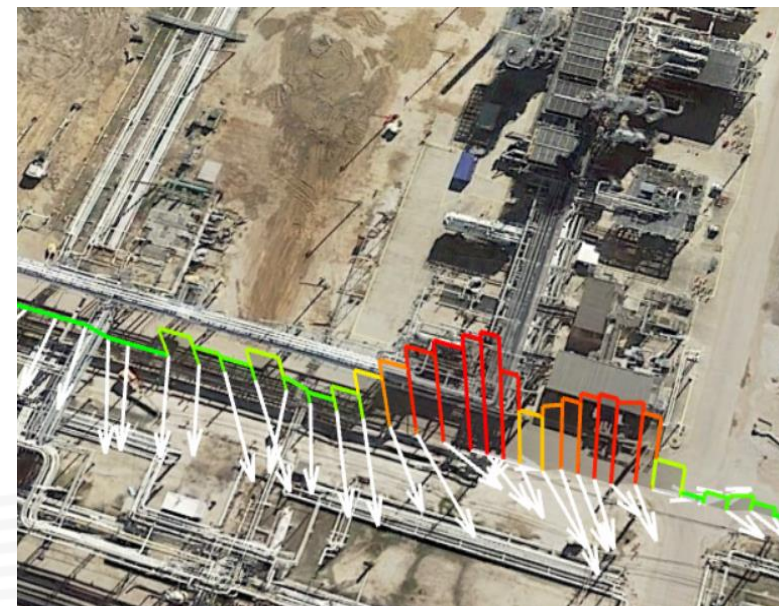
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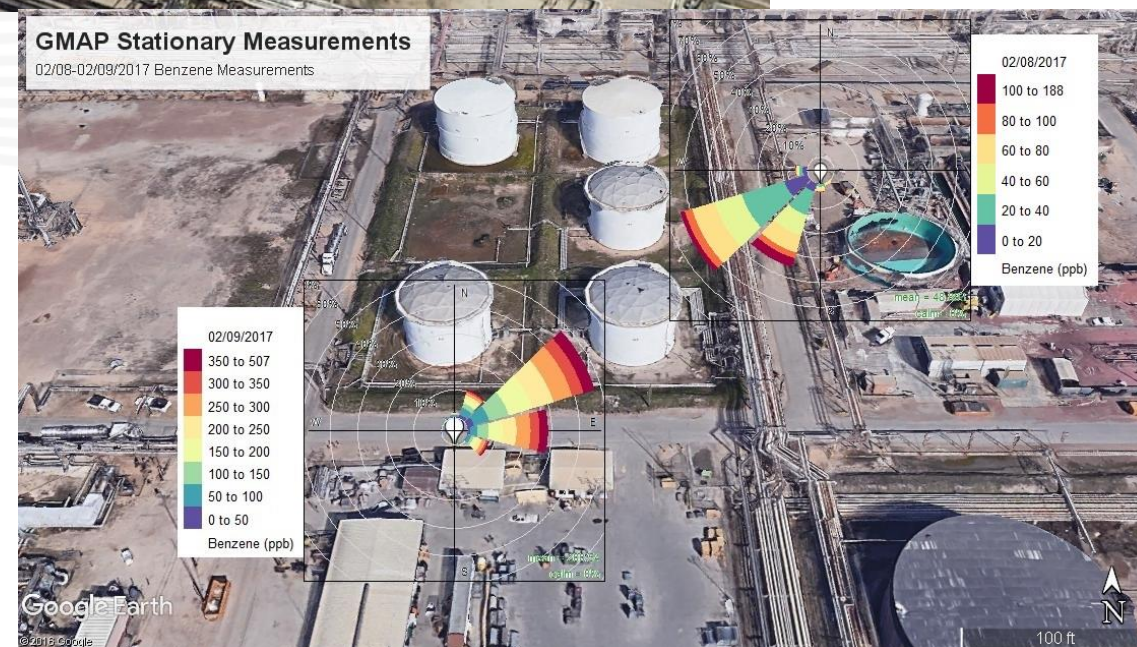
Technology

2022



GMAP Stationary Measurements

02/08-02/09/2017 Benzene Measurements



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Technology

- Sensor Based Networks
- Packing and Gaskets
- Leak Free Valves



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Environmental Justice (EJ)

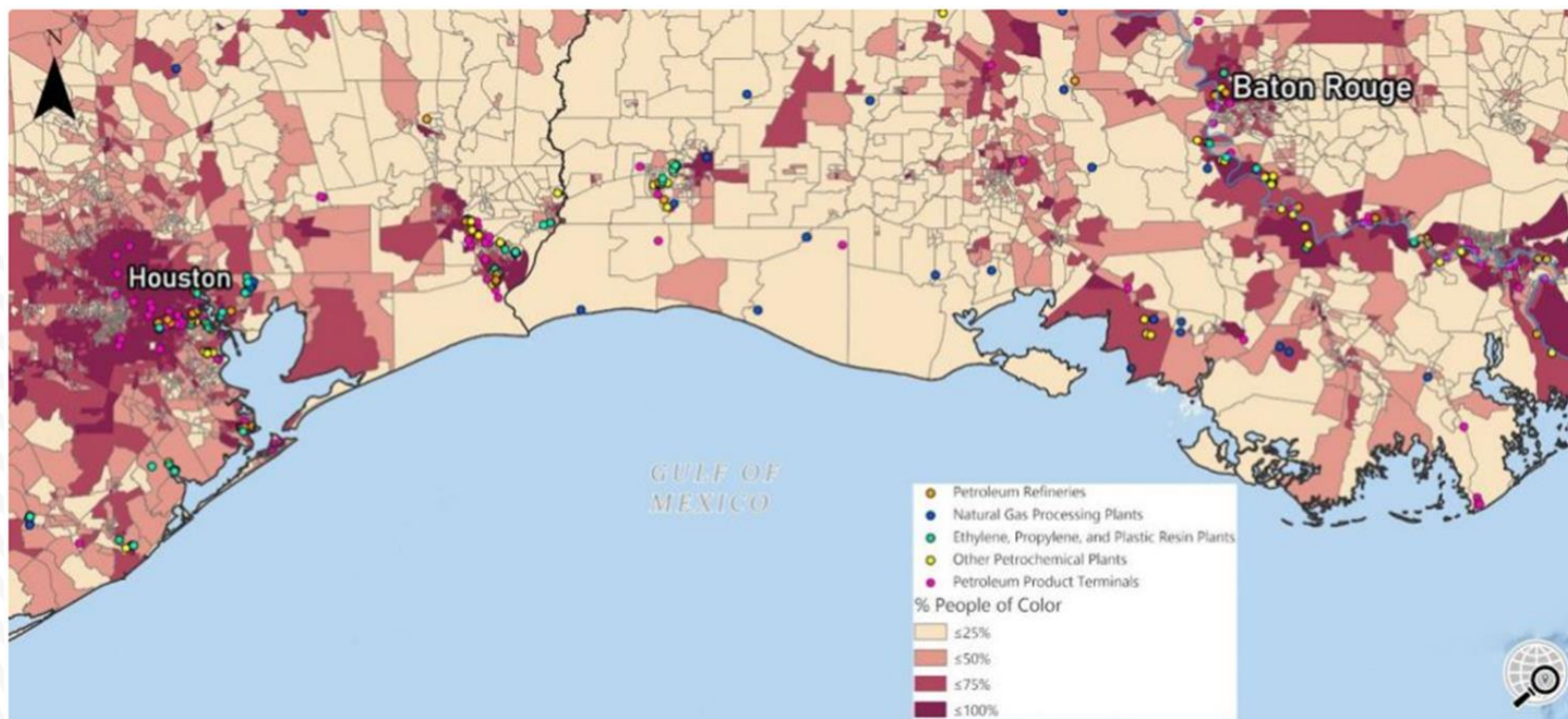
- EJ – is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

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Environmental Justice (EJ)

2022



Percentage of the population that are people of color, and points showing oil, gas, and petrochemical plants. **Data from the EPA EJ Screen** (2020 Version), and 2020 datasets from EIA, HIFLD, and the Environmental Integrity Project ((2021, May 3). Emission Increase Database and Pipelines Inventory. Retrieved from <https://environmentalintegrity.org/oil-gas-infrastructure-emissions>.”)

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Environmental Justice (EJ) - 2021

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- 1/20/2021 – Executive Order 13985
 - Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- 4/7/2021 – EPA Administrator Announces Agency Actions to Advance Environmental Justice
 - Administrator Michael S. Regan directed all EPA offices to clearly integrate environmental justice considerations into their plans and actions...
- 4/21/2021 – EPA Announces Plan to Update Toxics Release Inventory to Advance Environmental Justice

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Environmental Justice (EJ) – 2021 Cont. **2022**

- 5/14/2021 – EPA Uses Emergency Powers to Protect St. Croix Communities and Orders Limetree Bay Refinery to Pause Operations
- 5/27/2021 – EPA Administrator Regan Meets with Mayor Lightfoot, Community Leaders in Chicago to Advance Environmental Justice
- 6/2/2021 – Statement by Administrator Regan on the President's FY 2022 Budget
- 7/7/2021 – EPA Announces and Additional \$50 Million Under the American Rescue Plan to Enhance Air Pollution Monitoring

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Environmental Justice (EJ) – 2021 Cont. **2022**

- 9/24/2022 - EPA announced that it is establishing a new national office charged with advancing environmental justice and civil rights.

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Environmental Justice (EJ) – 2022

2022

- 3/28/2022 – EPA Strategic Plan
 - Objective 2.1 – Promote Environmental Justice and Civil Rights at the Federal, Tribal, State, and Local Levels

Obj 2.1	All EPA programs that seek feedback and comment from the public will provide capacity-building resources to communities with environmental justice concerns to support their ability to meaningfully engage and provide useful feedback to those programs.
	Include commitments to address disproportionate impacts in all written agreements between EPA and Tribes and states (e.g., grant work plans) implementing delegated authorities.
	EPA programs with direct implementation authority will take at least 100 significant actions that will result in measurable improvements in Indian country.
	All state recipients of EPA financial assistance will have foundational civil rights programs in place.
	Increase by 40% the number of Office of Research and Development activities related to environmental justice that involve or are applicable to Tribes, states, territories, local governments, and communities.

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Environmental Justice (EJ) – 2022

- 3/28/2022 – EPA Strategic Plan Cont.
 - Objective 2.2 – Embed Environmental Justice and Civil Rights into EPA’s Programs, Policies, and Activities

Obj 2.2	Reduce disparities in environmental and public health conditions represented by the indicators identified through the FY 2022-2023 Agency Priority Goal.
	80% of significant EPA actions with environmental justice implications will clearly demonstrate how the action is responsive to environmental justice concerns and reduces or otherwise addresses disproportionate impacts.
	All EPA programs that work in and with communities will do so in ways that are community-driven, coordinated and collaborative, support equitable and resilient community development, and provide for meaningful involvement and fair treatment of communities with environmental justice concerns.
	All EPA programs and regions will identify and implement areas and opportunities to integrate environmental justice considerations and achieve civil rights compliance in their planning, guidance, policy directives, monitoring, and review activities.
	All EPA programs and regions will implement program and region-specific language assistance plans.
	All EPA programs and regions will implement program and region-specific disability access plans.

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Environmental Justice (EJ) – 2022

2022

- 3/28/2022 – EPA Strategic Plan Cont.
 - Objective 2.3 – Strengthen Civil Rights Enforcement in Communities with Environmental Justice Concerns.

Obj 2.3	Initiate 45 proactive post-award civil rights compliance reviews to address discrimination issues in environmentally overburdened and underserved communities.
	Complete 305 audits to ensure EPA financial assistance recipients are complying with nondiscrimination program procedural requirements.
	Complete 84 information sharing sessions and outreach and technical assistance events with overburdened and underserved communities and environmental justice advocacy groups on civil rights and environmental justice issues.

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Environmental Justice (EJ) - Conclusion **2022**

- General Experience – Usually Two Prominent Outcomes on Environmental Justice Issues
 - 1) Delayed or Canceled Projects due to EJ concerns hampering an agency from issuing approved permits for construction and operation of proposed projects.
 - 2) Being forced to shutdown operations due to irresponsible operations causing threats to an adjacent community.

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