# Quality of Carbon Credit Projects & an Alternative Contributions Approach

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# Outline & main take homes

1. Most major offset programs to date significantly over-credit
2. Poor quality is inherent to the underlying incentive structure of carbon offsets
3. Way forward: shift from offsets to contributions

# UN's Offset Program (CDM)

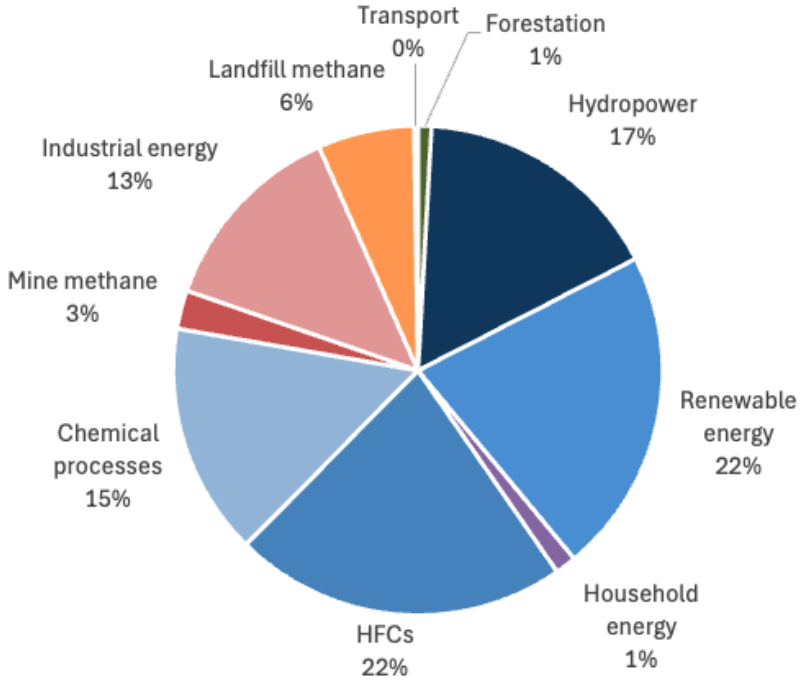
## Largest sources of over-crediting:

- Additionality
- Adverse selection

Haya, B. (2010) [Doctoral dissertation, Energy & Resources Group, University of California, Berkeley]. https://escholarship.org/uc/item/7jk7v95t

Cames, M., et al. (2016) Öko-Institut e.V. https://climate.ec.europa.eu/system/files/2017-04/clean_dev_mechanism_en.pdf

Total CDM Credits Issued to Date

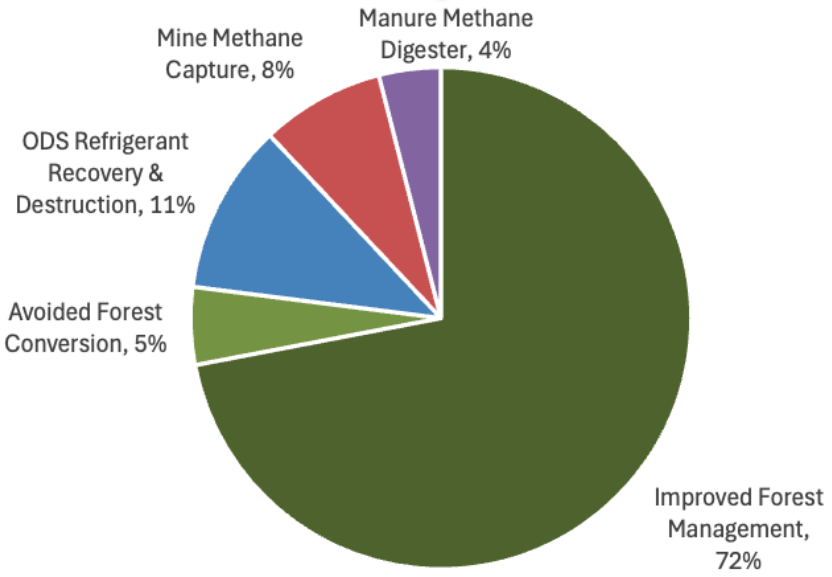



Total: 2.5 billion credits

Source: UNEP's CDM Pipeline, updated 17 April 2025
https://unepccc.org/cdm-ji-pipeline/

# California's Offset Program

Total CA Offset Credits Issued to Date




Total: 250 million credits

Source: Voluntary Registry Offsets Database, v2025-04
https://gspp.berkeley.edu/berkeley-carbon-trading-project/offsets-database

## Sources of over-crediting from improved forest management projects

- **Baselines**

  Stapp, J… Haya, BK et al. (2023) *Nature Communications Earth & Environment*. https://www.nature.com/articles/s43247-023-00984-2

  Coffield, SR, et al. (2022) *Global Change Biology*. https://doi.org/10.1111/gcb.16380

  Badgley, G… Haya, B, et al. (2021) *Global Change Biology*. https://doi.org/10.1111/gcb.15943

- **Leakage**

  Haya, B (2019) University of California, Berkeley working paper. https://gspp.berkeley.edu/assets/uploads/research/pdf/Policy_Brief-US_Forest_Projects-Leakage-Haya_4.pdf

- **Durability**

  Badgley, G, et al. (2022) *Frontiers in Forests and* Global Change. https://doi.org/10.3389/ffgc.2022.930426

- **Perverse incentives to increase carbon on over-stocked lands**

  Herbert, C, Haya, BK, et al. (2022) *Frontiers in Forests and Global Change*. https://doi.org/10.3389/ffgc.2022.957189

# Voluntary Carbon Market

## REDD+

- Flexibility >> over-crediting
  - 13 times over-credited from baselines
- Risk to forest communities

Haya, BH, et al. (2023) *Quality assessment of REDD+ carbon credit projects*. Berkeley Carbon Trading Project. https://gspp.berkeley.edu/research-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/REDD+

West, TAP, et al. (2023) *Science, 381*(6660), 873–877. https://www.science.org/doi/10.1126/science.ade3535

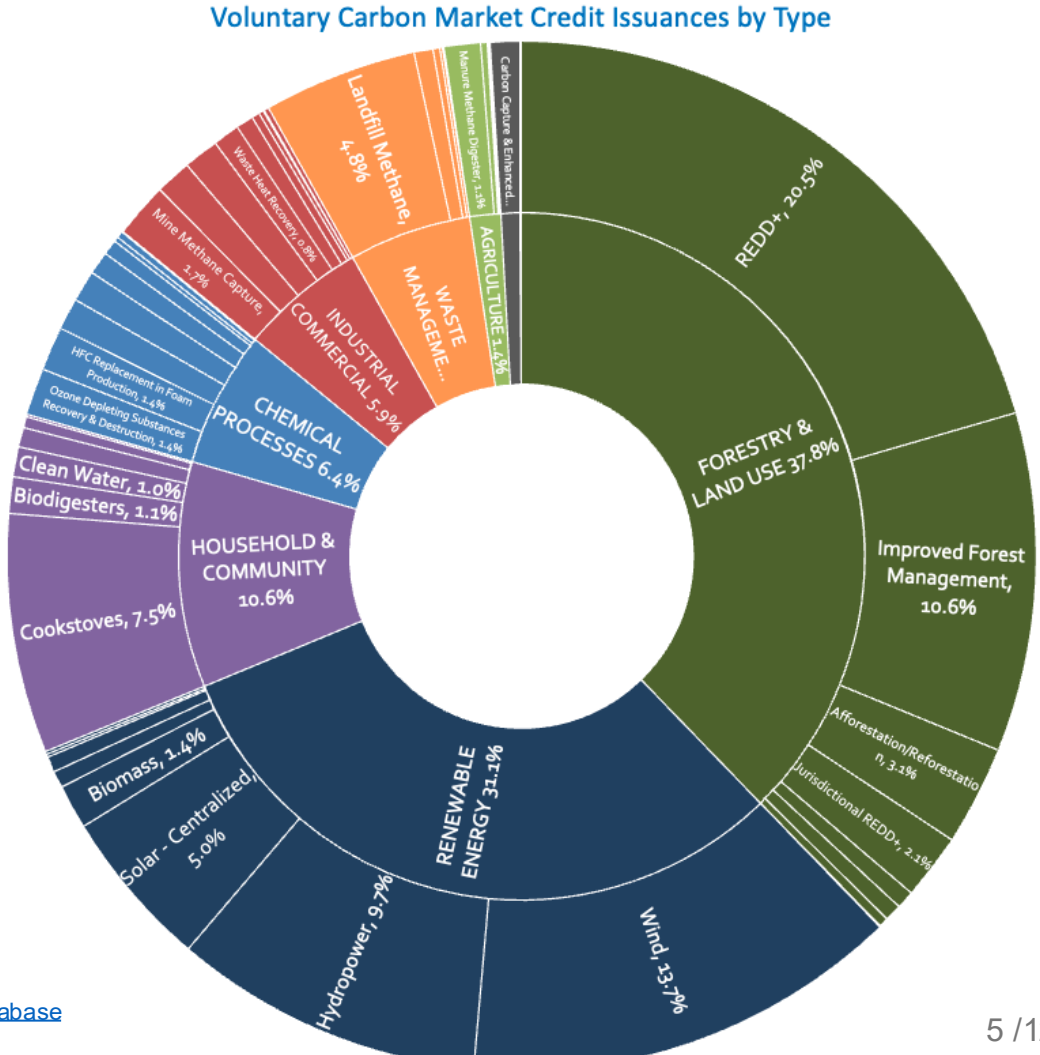
## Cookstoves

- 10 times over-credited by comprehensive over/under-crediting analysis

Gill-Wiehl, A, Kammen, DM, Haya, BH (2024) *Nature Sustainability*. https://www.nature.com/articles/s41893-023-01259-6
https://gspp.berkeley.edu/berkeley-carbon-trading-project/cookstoves

Total voluntary market: 2.4 billion credits

Source: Voluntary Registry Offsets Database, v2025-04
https://gspp.berkeley.edu/berkeley-carbon-trading-project/offsets-database



# Poor quality is inherent to the underlying incentive structure of carbon offsets

- High levels of uncertainty (especially in additionality/baselines) & information asymmetry
- Aligned interests: all market actors benefit from excess crediting
- Race to the bottom

# Way Forward

1. Efforts to create quality offset programs are unlikely to succeed
2. Shift from “offsetting” to “contributions” claims
3. Shift from offset markets to “direct contributions”

# Efforts to create quality offset programs are unlikely to succeed (1)

- Most important is to remove conflicts of interest
  - methodologies developed and evaluated against **clear criteria** by independent experts with interdisciplinary scientific and practical expertise
  - verifiers hired by an independent body rather than by project developers
  - credit calculations released publicly so independent parties can assess quality

# Efforts to create quality offset programs are unlikely to succeed (2)

- Criteria & comprehensive over/under-crediting analysis
  - Compare methodologies, and how they are implemented in practice by projects, against scientific literature and best practice, in a quantitative analysis,
    - Assessing quality programmatically
    - Assessing major quality elements – additionality/baselines, leakage, carbon accounting, durability, perverse incentives, on a path to deep decarbonization
    - Taking into account the lean towards over-crediting
    - Treating uncertainty conservatively
  - Nimbly update methodologies in response to new research and changing conditions
- Even if we remove most conflicts of interest, it is unclear if we will overcome the other structural challenges
- If quality is achieved, prices will be much higher

# Shift from “offsetting” to “contributions” claims

“Carbon offsetting”

- Creates disincentive to reduce own emissions

↓

“Contributing”

- Refocuses attention on direct emissions reductions
- Creates flexibility to support a wider range of activities based on a wider set of goals

Blanchard, L, Haya, BK, et al. (2024) Funding forests’ climate potential without carbon offsets. *One Earth*. https://doi.org/10.1016/j.oneear.2024.06.006

Blanchard, L., Anderegg, W. R. L., Haya, B. K. (2024). Instead of Carbon Offsets, We Need ‘Contributions’ to Forests, *Stanford Social Innovation Review,* https://doi.org/10.48558/1MV0-5528

# Shift from offset markets to direct contributions

- Directly contributing to organizations, programs, and projects
- Providing funds up front
- Denominating primarily in money rather that tons
  - Take many factors into account, not just inexpensive carbon
  - Can support a set of activities to drive decarbonization, including some with hard-to-quantify GHG benefits
- >> Climate finance as a supplier or donation, rather than a commodity

# Main take homes

1. Most major offset programs to date significantly over-credit
2. Poor quality is inherent to the underlying incentive structure of carbon offsets
3. Way forward: shift from offsets to contributions
    - Efforts to create quality offset programs are unlikely to succeed
    - Shift from “offsetting” to “contributions” claims
    - Shift from offset markets to “direct contributions”