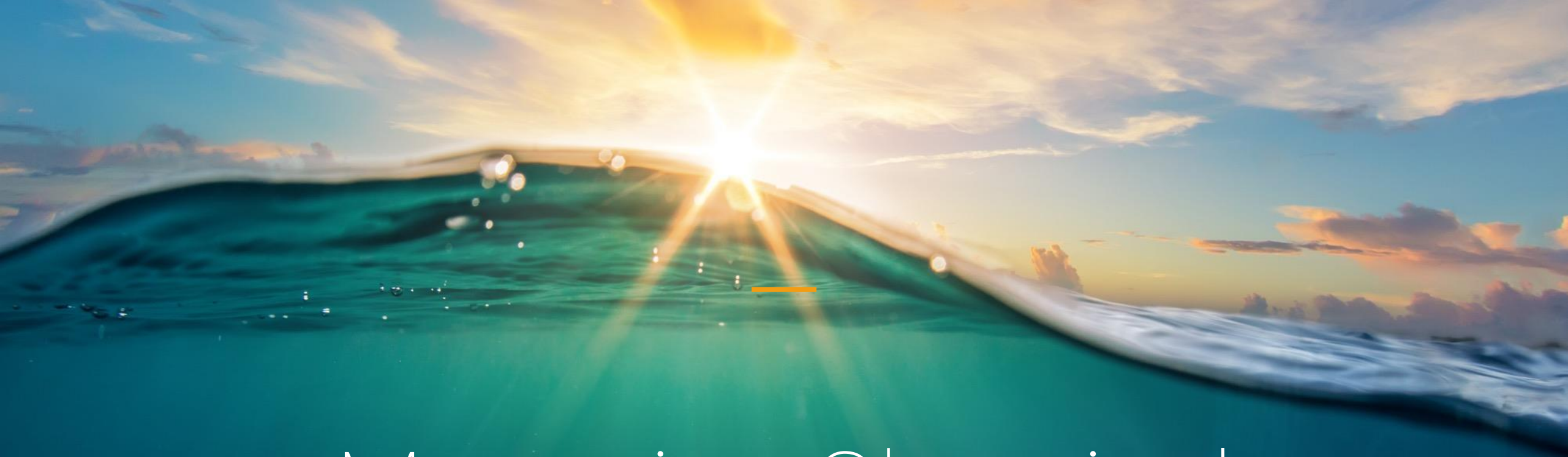

Managing Chemical Recycling in EPR

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Ocean Conservancy®

MISSION

Ocean Conservancy is working with you to protect the ocean from today's greatest global challenges.

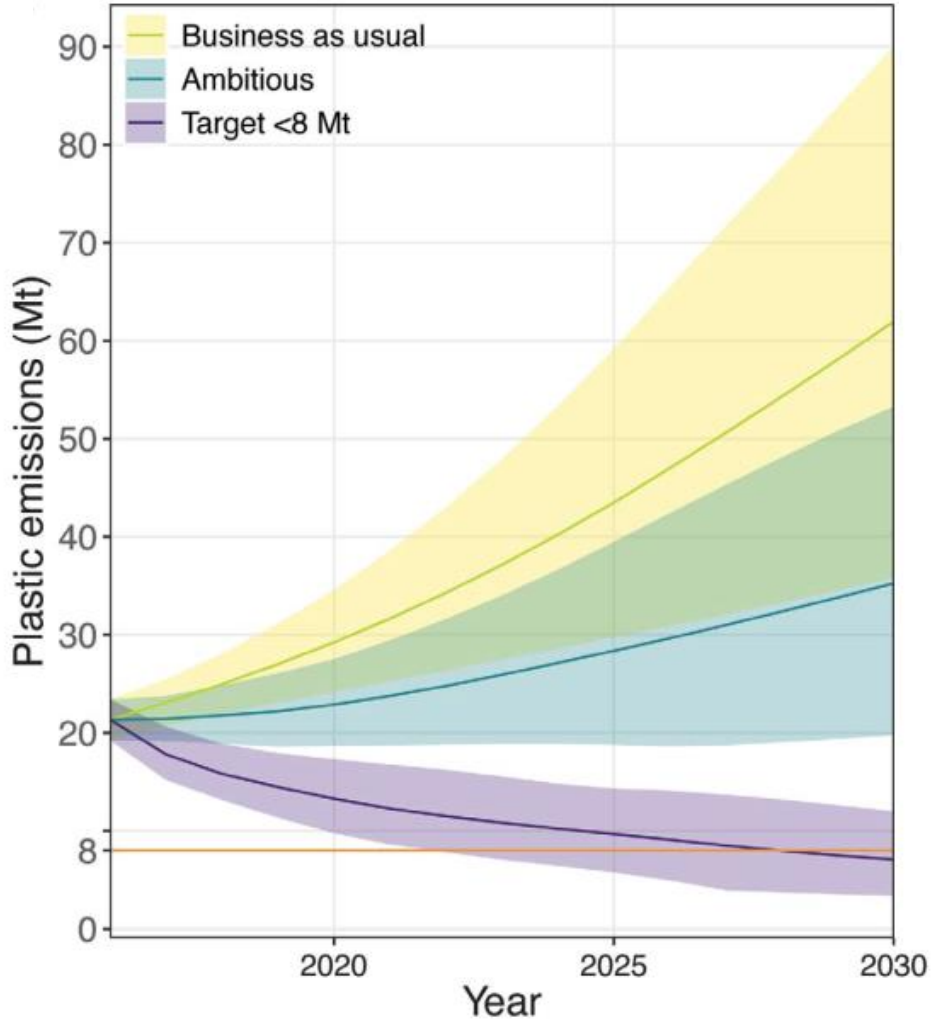
Together, we create the science-based solutions for a healthy ocean and the wildlife and communities that depend on it.

Our vision is a healthy ocean that sustains life on the planet. We envision a world where we all work together to keep the ocean and our coastal communities healthy and prosperous.

We need a comprehensive approach to address our plastic pollution crisis starting with **making less plastic**

To reduce plastic emissions into the ocean to **8 Mt a year** (2010 levels), we need to:

- Make less plastic – high income countries **40% decrease** per capita
- Increase quantity and quality of recycled plastics
- Continue targeted clean ups



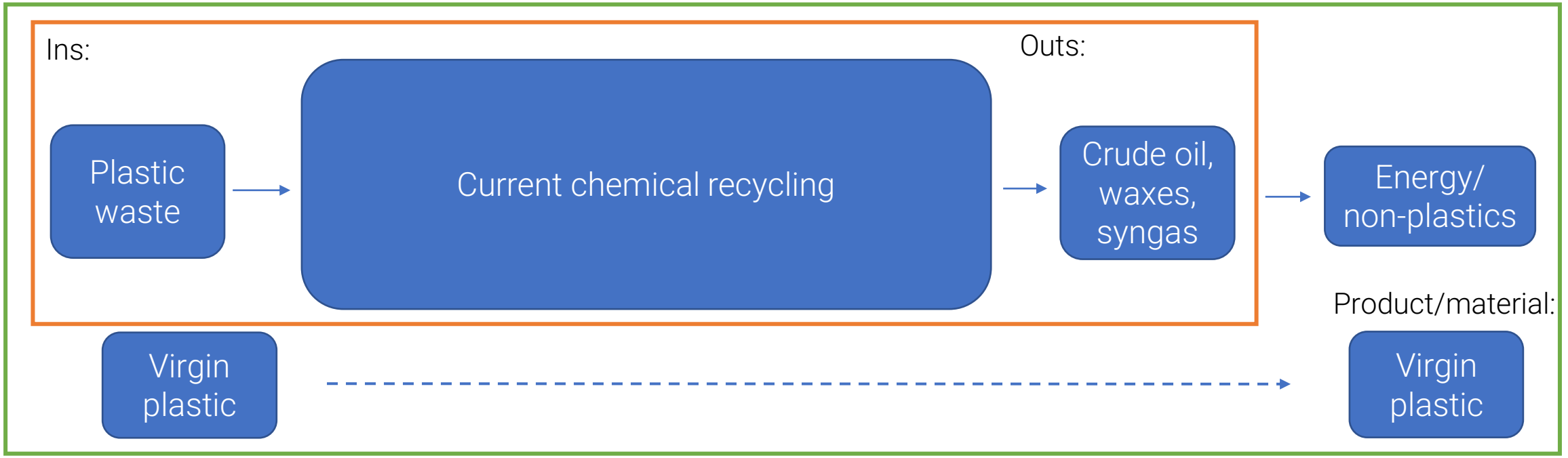
Borrelle et al., 2020

Policy Position on Chemical Recycling

Ocean Conservancy does not presently support any form of chemical recycling. In its current form, chemical recycling does not contribute to a circular plastics economy because it is not plastics-to-plastics recycling and creates environmental and social harms that are inconsistent with our goal of a healthier ocean supported by a more just world.

- A comprehensive approach focused on reducing plastic production is needed to reduce the harms of plastics on our communities, climate, and ocean.
- Any improvements in recycling technology will require upstream policy efforts to increase collection and streamline product design for a more economically viable system with less contamination. These efforts need to be supported by sustainable financing that unburden the ratepayer and hold producers accountable.
- Chemical recycling technologies that recover plastic material (i.e., plastics-to-plastics) are in early development and will likely not operate at scale for some time.
- Conversion chemical recycling technologies can perpetuate historic environmental and social injustices based on their emissions and siting.
- The environmental impacts for emerging chemical recycling technologies (e.g., purification technologies) remain unproven at scale and when facing challenges that exist within real waste streams.
- Focusing on chemical recycling or any other single solution as a “quick fix” to the plastic pollution crisis risks delaying the systemic changes needed to build a circular economy.

Current chemical recycling technologies do not contribute to a circular economy



- Conversion technologies break the polymer chain into various hydrocarbon products including crude oils, waxes, and syn gas.
- Technologies that do not recover plastic perpetuate our dependence on virgin plastic (and fossil fuel extraction).
- These are the most common technologies on the market and were ranked lowest when it comes to value-added to existing collection and sortation systems, climate impact, and processing efficiency.

Current chemical recycling technologies have harmful emissions and disproportionately impact environmental justice communities

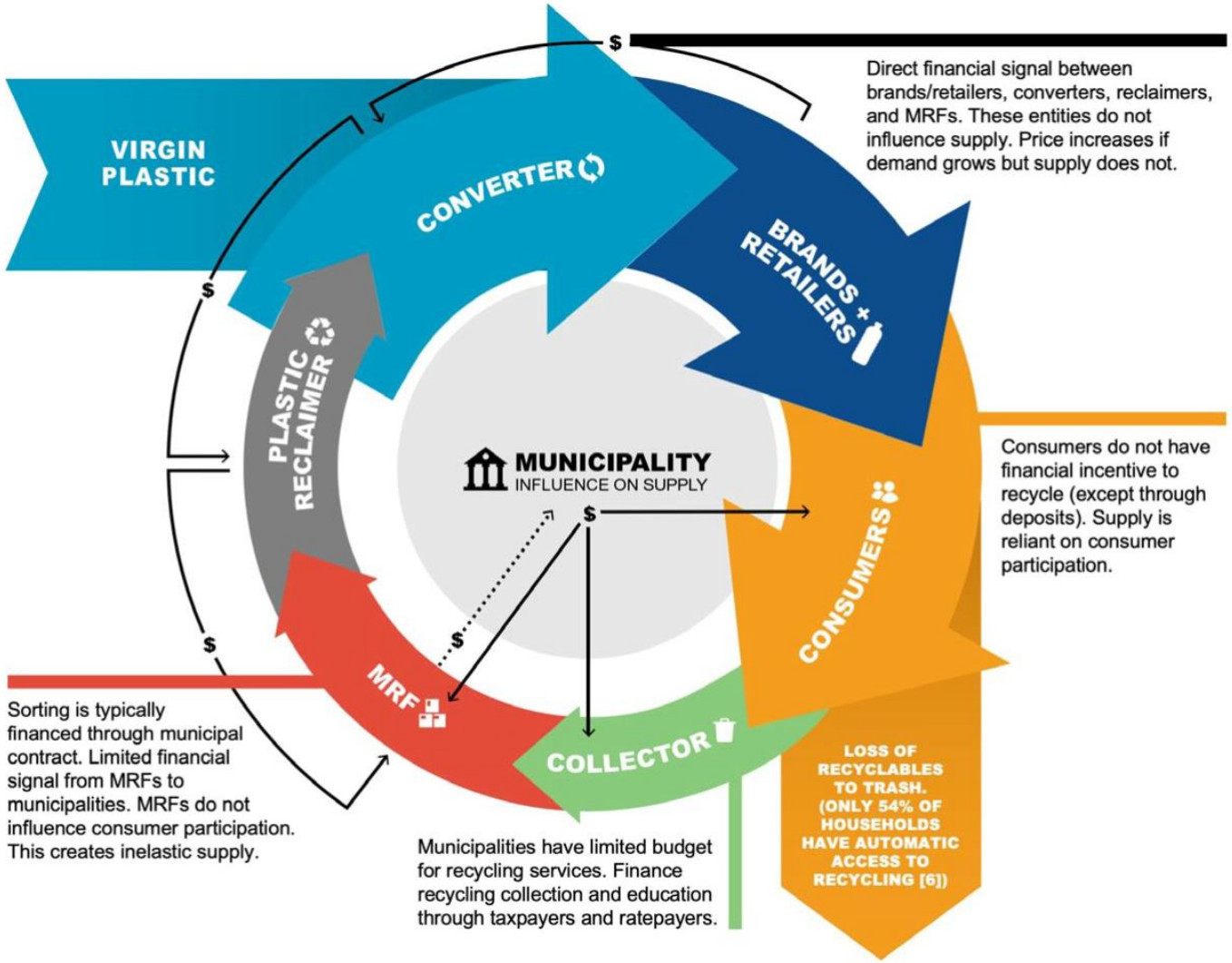
- The majority of these systems are sited in lower income communities and communities of color.
- These technologies are all known to produce harmful polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), carbon monoxide, nitrous oxides, as well as release toxins associated with plastics themselves (Conesa et al., 2009)
  - In 2015, scientists estimated seven of the most commonly polluted plastic items carried with them approximately 190 metric tons of 20 different chemicals additives into our ocean (SOURCE: IEAM)
  - Toxics from plastics have been found in the products (e.g., oil), byproducts (e.g., char), and air emissions from chemical recycling like pyrolysis (SOURCE: GAIA).
- Recycling that recovers plastic will always perform best from a GHG/climate perspective because of the emissions avoided by production of virgin plastic resin.
- In addition to not recovering plastic material, current chemical recycling systems are energy-intensive processes.
  - It is estimated that for one ton of mixed plastic waste:
    - Incineration emits 1777 kg CO_2-equivalent (SOURCE: BASF).
    - Pyrolysis emits 739 kg CO_2-equivalent (SOURCE: BASF).
    - Mechanical recycling emits 482 kg CO_2-equivalent (SOURCE: APR).

We have all the tools we need to improve our recycling system

Current challenges:

- Insufficient supply:
  - Only 73% of American households have access to curbside recycling, only 53% have automatic access (SPC and RRS)
- High rates of contamination lead to low quality outputs
  - Surge of single-use product types, materials, and formats without consistent product design
    - Half of all plastics ever made have been made in the last 20 years (Geyer et al., 2017)
  - Lack of standard recycling labeling (e.g., “chasing arrows”)
  - Sortation challenges
- Lack of recycling system standardization
  - Nearly 10,000 separate recycling systems nationwide

→ Chemical recycling doesn’t address any of these major issues



Ocean Conservancy and RRS, 2022, “Recommendations for Recycled Content Requirements for Plastic Goods and Packaging”

Layered approach of protections in EPR in California (SB 54)

1. Definition of recycling
2. Prohibitions on how funding can be used by the PRO to support these technologies
3. Statutory mandates for CalRecycle to avoid environmental justice impacts

Defining recycling to mean recovering material as a part of a circular economy

- "Recycle" or "recycling" means the process of collecting, sorting, cleansing, treating, and reconstituting materials …and returning them to, or maintaining them within, the economic mainstream in the form of recovered material
- "Recycle" or "recycling" does not include any of the following:
  - Combustion.
  - Incineration.
  - Energy generation.
  - Fuel production, except for anaerobic digestion of source separated organic materials.
  - Other forms of *disposal*.
    - Where *disposal* is defined in California to include transformation (incineration, distillation, pyrolysis, biological conversion) and engineered solid waste management conversion (gasification)
- The department's regulations shall encourage recycling that minimizes generation of hazardous waste, generation of greenhouse gases, environmental impacts, environmental justice impacts, and public health impacts
- The department may adopt regulations to define guidelines and verification requirements for covered material shipped out of state and exported to other countries for recycling

Additional protections against technologies that do not contribute to a circular economy

- A producer or PRO shall not expend revenue collected for implementation of the plan for any of the following purposes:
  - To subsidize, incentivize, or otherwise support **incineration, engineered municipal solid waste conversion, the production of energy or fuels**, except for fuels produced using anaerobic digestion of source separated organic materials, or **other disposal activities**.
- In adopting regulations pursuant to this section, the department shall ensure the regulations, and activities conducted in accordance with the regulations, **avoid or minimize disproportionate impacts to disadvantaged or low-income communities or rural areas**

There is no quick fix to our plastic pollution crisis

- All of these technologies require pre-treatment like our existing mechanical recycling system.
- Investments in these technologies divert time, energy, and funding away from solving our plastic pollution crisis.
  - These are capitol intensive technologies that lock us in to a culture of disposability when we know to address this crisis we need to be headed in the other direction.
  - A recent investigation by Reuters revealed that of 30 projects reviewed, most are operating at a modest scale or closed (at least 4 have either been closed or indefinitely delayed), and more than half are years behind previously announced schedules.
- These facilities receive solid waste and must be regulated as such.
- There is a lack of transparency, disclosure, standardized reporting and regulations for these technologies – we don't know how facilities are operating, pollutants, yields, what solid waste feedstocks they're accepting, or what exactly they are producing.

Questions?

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Please email me for fact sheets and other supporting documents or additional information.

Thank you!

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