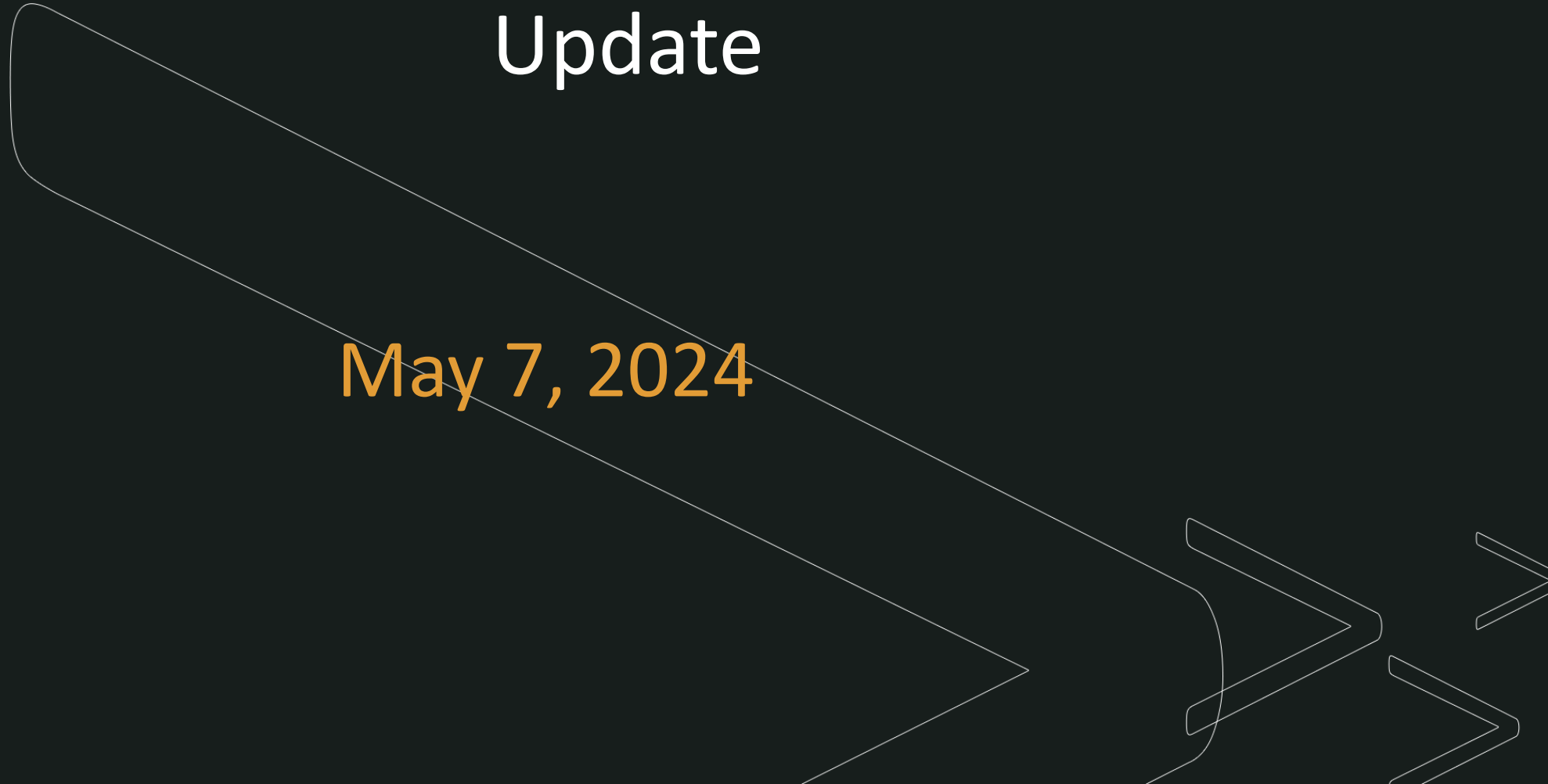


# CARE National Market Development Update

May 7, 2024



# CARE National Grid

By the numbers

*Total Grid Items Since Inception:*

**104**

*Number of Active Entities:*

**28**

*Chemical Recycling one large category*

*Number of Active California :*

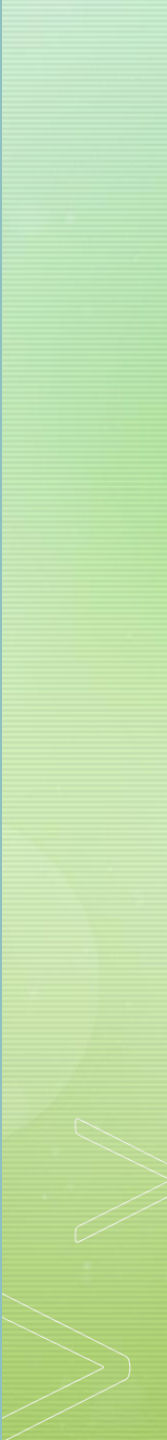
**18**

*Companies processing or involved in Ca. Carpet Purchases*



# Present State of Carpet Recycling:

Where are we today



## Residential Carpets: Mechanical Recycling technology has peaked

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*Mechanical Recycling Technology: After development for 20 years, technology has peaked.*

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*Dry systems: Dry Systems remove ash (PC4). Several systems functioning today both East and West. Capacity is Plentiful.*

*Aqueous systems: Separate Face Fibers from Backing Fibers. No new Aqueous systems have been installed in 15 years. Investment of several million Dollars.*

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*Where is the next leg of Growth.*

## Commercial Carpet Tiles: Mechanical Recycling opportunity

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*Commercial Share: Approximately 25% of Carpet Sales*

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*Carpet Tiles: Approximately 75% of Commercial Sales*

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*Four General Backing Types:*

*PVC. PVB (Polyvinlyl Butyral). PE (Polyolefin). PU (Polyurethane).*

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*Mechanical Recycling development: Tile recycling Technology appears to be the one of next opportunities for increased PC Carpet Recycling*

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*Development: Several Companies Involved in additional recycling development for carpet tile backings : PVC, PVB, PU.*



# Recycling Headwinds

Economic Challenges



## Uncertain & Unfavorable Economic Conditions

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*Demand for materials have slowed: Prices and volumes for all plastic commodities are the lowest since the Pandemic.*

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*UAW Strike: Crippled plastic demand for the Auto Sector. Companies who purchase PC carpet output, reduced purchases in 2023.*

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*Some October headlines:*

*Braskem Stops production of 450 million Lb. PP line*

*Lego Ditches Recycled PET plans*

*Ohio Recycled PET Jar maker Closes doors*

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*Forecast from Major Wall Street firms*

*Modest rebound in demand and pricing Mid to late 2024*

*Depends on Fed. Moderating Interest Rates.*



# Brief Highlights





# Eastman Chemicals:

Kingsport Tennessee

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*Present Process: CRT (Carbon Renewal Technology). Uses California PC Carpet*

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*Transitioning to Methanolysis: Chemical Recycling of PET Carpet. Project at least 2 years behind schedule*

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*Potential: Millions of pounds of PC carpet PET.*

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*Outlook for Carpet: Presently, of all the Chemical Recycling development, Eastman system is the only one committed to the Chemical Recycling of PC Carpet.*

**Kian Green Up LLC**  
**California**

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*New CARE Member: Operational In Late 2024.*

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*Business: Producer of Nylon Pellets. Makes Neat Nylon pellets as well as Compounded Glass Filled and Impact Modified Nylon pellets used in Automotive and other applications.*

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*Carpet Recycling involvement: Pelletize Apex nylon 6 and Nylon 66 Output.*



# CHEMICAL RECYCLING

The Next Frontier



## Headwinds and Challenges

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*Environmental Groups: Insist on plastic bans and caps on Virgin Production.*

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*Environmental. Groups: Contend CR pollutes more than Virgin Production and uses more energy and water*

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*Environmental. Groups: Battle Legislative Bodies to shut down Chemical Recycling . Contend that it is simply a form of “Waste Management”.*

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*Future of Chemical recycling: Many battles of Ideas both in Federal and State Legislative Bodies. Meanwhile Exxon, Shell, Purecycle, Braskem, Dow, and host of others continue chemical recycling development.*

## Chemical Recycling: Some statistics

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*DOE Argonne National Laboratory: Found that CR produces significantly less Greenhouse gas emissions compared to Virgin Production.*

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*DOE: Likewise found that CR uses much less water than Virgin Production*

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*US Chemical Recycling Plants: 11 Chemical Recycling plants are in various stages of operation in the US.*

## Observations

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*Dry Mechanical Recycling: RO Outputs have limited market without additional polymer separation. **Most applications have peaked.** Mixed polymers limit high value applications*

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*Wet Mechanical Recycling: Produces high value by separating face and backing fibers but limited US capacity.*

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*Dry/Wet Systems: Viable for Nylon6/66. Nylons are relatively high priced commodities.*

*Not viable for PP or PET.*

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*Where is Growth: Tile recycling development is large potential.*

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*Chemical Recycling could be the growth Engine for all carpet commodities. Will take years to fully develop*

**Thank You**

