

## Goal

To reduce the amount of ASR, by weight, landfilled each year across the United States.

## What is ASR, and why is it a Problem?

Mix of non metal components of an end-of-life vehicle (ELV) car that remains after:

- plastic, fabric, rubber, wood, wires, metal, miscellaneous (dirt, sand, fines)

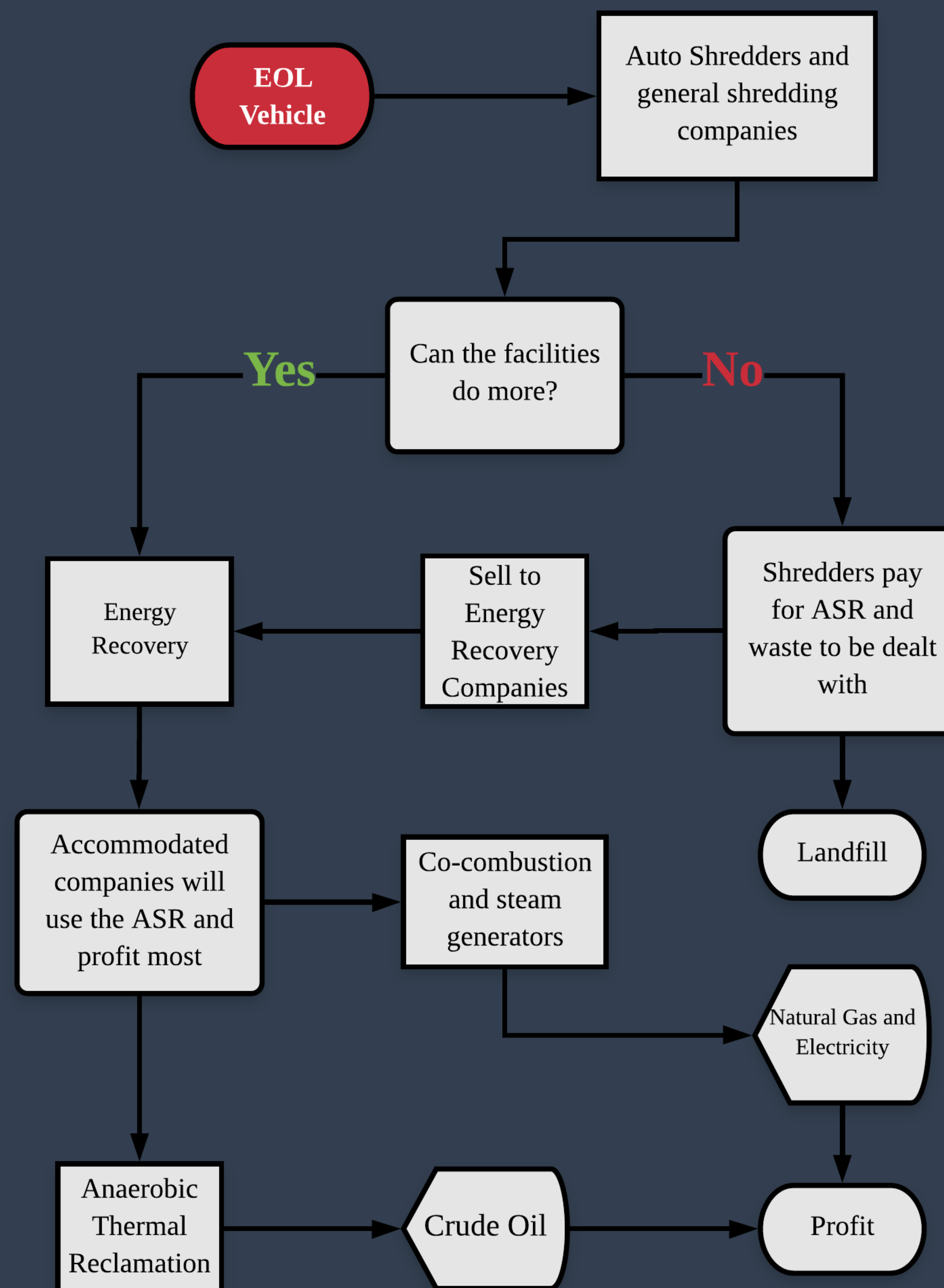
Damaging to environment

Across United States:

- 2-3 million tons of waste produced
- \$130 million a year in landfilling costs

Landfill space is becoming very limited

## Methodology



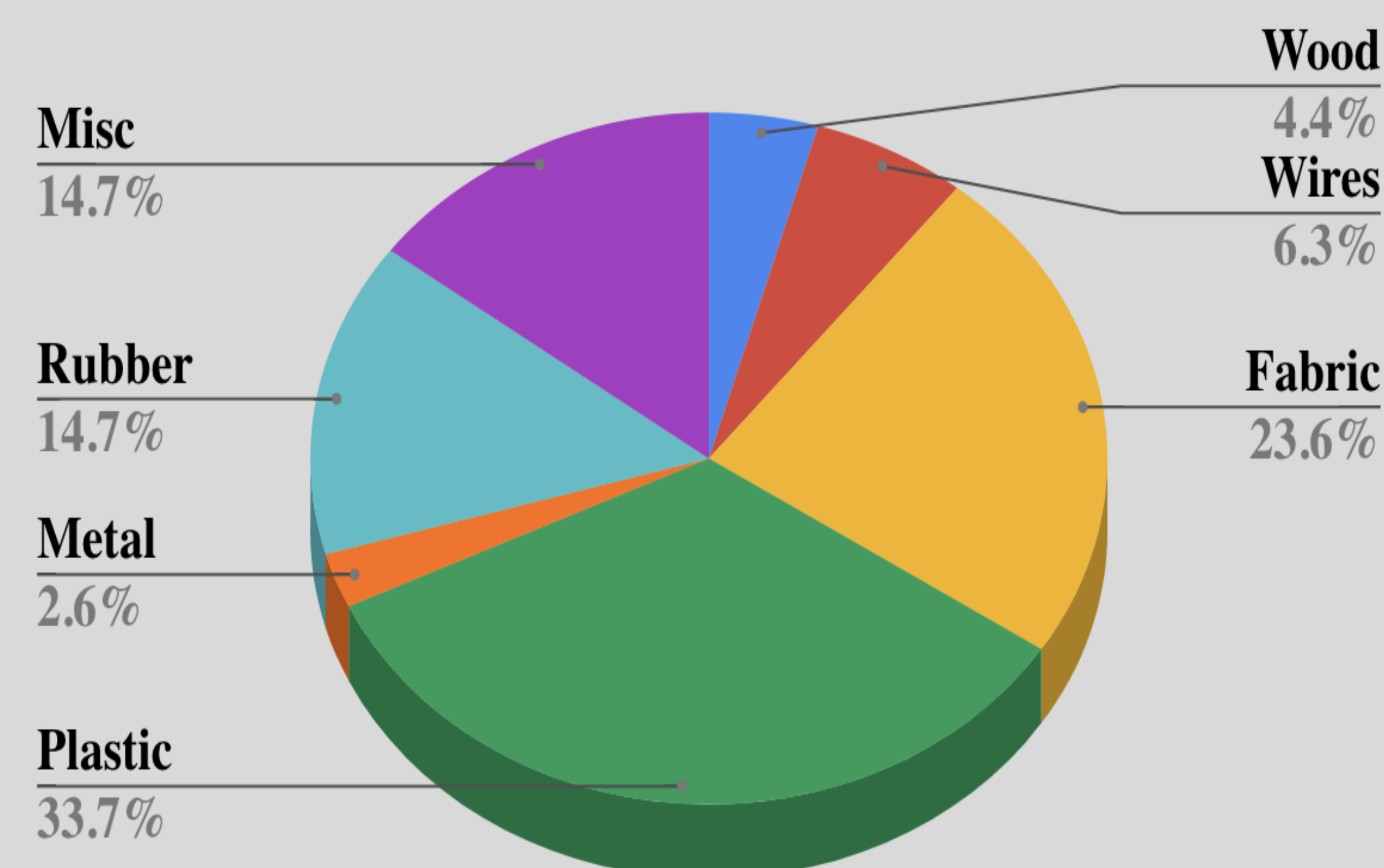
## Results

Energy recovery from ASR is a viable and profitable solution

- Estimated > \$1.2 million in revenue generated per year
- Estimated 300,000 tons of ASR can produce 180,000 megawatt hours of electricity

Cost to implement this process is currently too high for companies unequipped to process ASR. With landfill costs rising and space decreasing, and environmental concerns growing, this process will need to be implemented in the next 15 years.

## Composition of ASR



## Acknowledgments

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## References

- Vermeulen, Isabel. "Automotive Shredder Residue (ASR): Reviewing Its Production from End-of-Life Vehicles (ELVs) and Its Recycling, Energy or Chemicals' Valorisation." *Journal of Hazardous Materials*, Elsevier, 6 Mar. 2011.
- Handoko, Wilson. (2015). Automotive Shredder Residue Recycling - Working Towards ZERO Waste - Characterisation and High Temperature Transformation.
- Margarido, Fernanda & Nogueira, Carlos. (2011). CHARACTERISATION OF AUTOMOTIVE SHREDDER RESIDUE. 10.13140/2.1.2251.6489.
- Inglezakis, Vassilis & Zorpas, Antonis. (2009). Automotive shredder residue (ASR): A rapidly increasing waste stream waiting for a sustainable response. *WIT Transactions on Ecology and the Environment*. 120. 256-262. 10.2495/SDP090782.
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