● CARBONCALCPCF.COM • CERTIFIED LCA OUTPUT

Acetone PCF Dashboard

C_3H_6O • 99.5% Pure

1.0 kg Functional Unit | Lifetime (Cradle-to-Grave) | US Gulf Coast (USGC)

GHG Protocol + 2026 LSR

TOTAL PRODUCT CARBON FOOTPRINT

4.204 kg CO_2e

PER FUNCTIONAL UNIT (1.0 KG)

CRADLE-TO-GRAVE TOTAL

✔

4.204 kg CO_2e

Total cradle-to-grave lifetime footprint

EMBEDDED CARBON

⚠

62.04%

0.620 kg fossil C → 2.274 kg CO_2e EoL

TOP MATERIAL HOTSPOT

◆

Benzene

0.720 kg CO_2e (58.9% of feedstock impact)

PRIMARY SCOPE

▲

Scope 3

85.5% of footprint (3.596 kg CO_2e)

Lifecycle Stage Carbon Allocation

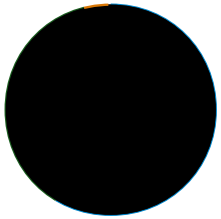
NORMALIZED (KG CO_2E / KG)

End-of-Life (Cat 12)	**2.274**	(54.1%)
Raw Materials (Cat 1)	**1.222**	(29.1%)
Direct Plant (Scope 1)	**0.385**	(9.2%)
Grid & Steam (Scope 2)	**0.223**	(5.3%)
WTT & Logistics (Cat 3,4,9)	**0.100**	(2.4%)

SCOPE 1 DIRECT	**0.385**	**9.16%**
SCOPE 2 UTILITIES	**0.223**	**5.30%**
SCOPE 3 CHAIN	**3.596**	**85.54%**

Upstream Feedstock Contribution

CATEGORY 1 DETAIL



Petrochemical Benzene	**0.720 kg (58.9%)**
Chemical Propylene	**0.457 kg (37.4%)**
Catalysts & Auxiliaries	**0.045 kg (3.7%)**
Total Cat 1 Feedstocks	**1.222 kg CO_2e**

MASS ALLOCATION RATIO (HOCK CLEAVAGE PROCESS)

Acetone: 38.17% (1.00 kg)

Phenol: 61.83% (1.62 kg co-product)

Lifecycle Hotspot Highlights

AUDIT FINDINGS

1. **End-of-Life release drives >54% of emissions**
   Due to its high volatility and solvent use profile, 100% of acetone's 62.04% fossil carbon content is oxidized to CO_2 (2.274 kg CO_2e) upon use and disposal.

2. **Feedstock refining is the dominant upstream hotspot**
   Propylene steam-cracking and benzene extraction contribute 1.177 kg CO_2e (28.0% of lifetime PCF), dwarfing direct plant emissions.

3. **Zero 2026 LSR biogenic offset capability**
   Current production is 100% fossil hydrocarbon synthesis, resulting in 0.000 kg CO_2e biogenic carbon removals under new GHG Protocol LSR guidance.

Decarbonization Action Plan

PATHWAYS TO NET ZERO

⇧ **Transition to Bio-Propylene & Bio-Benzene**

Adopting hydrotreated vegetable oil (HVO) olefins unlocks 2026 LSR biogenic removals, potentially neutralizing the 2.274 kg EoL burden.

⚡ **Electrify Column Reboilers (MVR Heat Pumps)**

Replacing gas-fired cleavage distillation with mechanical vapor recompression coupled with renewable PPAs can slash Scope 1 & 2 by up to 68%.

◎ **Industrial Carbon Capture & Storage (CCS)**

Equipping thermal oxidizers with point-source amine capture on Gulf Coast Hock lines captures ~0.28 kg direct CO_2 per kg produced.