

# CO2e Emissions of RCP vs. HDPE/PP

Comparative emissions of 1 foot of 18" pipe in lbs CO2e

	RCP	HDPE	PP
Product Emissions:	<b>37.1</b>	<b>18.0</b>	<b>31.1</b>
Transport Emissions:	<b>1.7</b>	<b>1.5</b>	<b>2.7</b>
Backfill Emissions:	<b>4.0</b>	<b>8.5</b>	<b>8.5</b>
Recaptured Carbon:	<b>-6.7</b>	-	-
End Use Emissions:	<b>-2.3</b>	<b>1.6</b>	<b>1.8</b>
<b>SUBTOTAL:</b>	<b>33.9</b>	<b>29.7</b>	<b>44.1</b>
Life Expectancy (yrs)	100	50	50
Life Cycle Factor	1.0	2.0	2.0
<b>100-YR TOTAL:</b>	<b>33.9</b>	<b>59.4</b>	<b>88.2</b>

Emission Factor (lbsCO2e/lb)		
RCP	HDPE	PP
0.221	2.52	4.49
Pipe Weight (lbs/ft)		
RCP	HDPE	PP
168	7.2	6.8

**Average Transportation Distance (mi)**

RCP: 250+ ACPA Plants, 50-60 miles  
 HDPE: ~50 HDPE Plants, 140+ miles  
 PP: <15 PP Plants, 250+ miles

**Pipe Footage Per Load (ft)**

RCP: 296'  
 HDPE/PP: 800'

**Imported Structural Fill (lbs/ft)**

Material	RCP	HDPE/PP
Mining	5123	1081.4
Transport	0.0052 lbsCO2e/lb	0.0027 lbsCO2e/lb

**Carbonation of Cement (lbsCO2e/lb)**

Cement Production:  $CaCO_3 \rightarrow CaO + CO_2$  (0.93 lbsCO2e/lb)  
 Carbonation:  $CaO + CO_2 \rightarrow CaCO_3 + H_2O$  (0.40 lbsCO2e/lb)  
 11% cement content

**Material Properties Over Time**

**Product History (yrs)**

RCP: 125+  
 HDPE: 55+  
 PP: <15

**Disposal Emissions (lbsCO2e/lb)**

Material	Disposal Method	Emissions (lbsCO2e/lb)
RCP	90% Recycled	-0.0052
	5% Landfilled	+0.044
	5% Repurposed	-0.221
HDPE/PP	8.4% Recycled	-0.97
	75.8% Landfilled	+0.044
	15.8% Incinerated	+1.4