

Change log (hidden)

Annex 8 Storage costs

This annex reviews hydrogen and syngas storage costs

$$C_{storage} := \frac{33.3 \cdot 10^6 \cdot \text{€}}{865.2 \cdot \frac{\text{ton}}{\text{day}}} \quad \text{Cocco et al., 2013}$$

$$C_{storage} \cdot CoC = 21.075 \frac{\text{€}}{\text{ton}}$$

$$P_{storage} := \frac{46.9 \cdot 10^6 \text{ W}}{865.2 \cdot \frac{\text{ton}}{\text{day}}} = (4.683 \cdot 10^3) \frac{10^6 \cdot \text{J}}{\text{ton}} \quad \text{Cocco et al., 2013}$$

$$P_{storage} \cdot p_E = 65.049 \frac{\text{€}}{\text{ton}}$$

$$LCOS_{H2} := 0.33 \cdot \frac{\text{USD}}{\text{kg}} = 297 \frac{\text{€}}{\text{ton}} \quad \text{Abdin et al., 2022}$$

Ethanol case

$$Y_{eth_syn} := 1.534 \cdot \frac{\text{kg}}{\text{kg}}$$

$$\frac{C_{storage} \cdot CoC}{Y_{eth_syn}} = 13.739 \frac{\text{€}}{\text{ton}}$$

$$\frac{P_{storage} \cdot p_E}{Y_{eth_syn}} = 42.405 \frac{\text{€}}{\text{ton}}$$

$$Y_{eth_H2} := 5.713 \cdot \frac{\text{kg}}{\text{kg}}$$

$$\frac{LCOS_{H2}}{Y_{eth_H2}} = 51.987 \frac{\text{€}}{\text{ton}}$$

Methanol case

$$Y_{meth_H2} := 5.891 \cdot \frac{\text{kg}}{\text{kg}}$$

$$\frac{LCOS_{H2}}{Y_{meth_{H2}}} = 50.416 \frac{\text{€}}{\text{ton}}$$

Literature

Abdin et al., 2022 [38]

Cocco et al., 2013 [37]