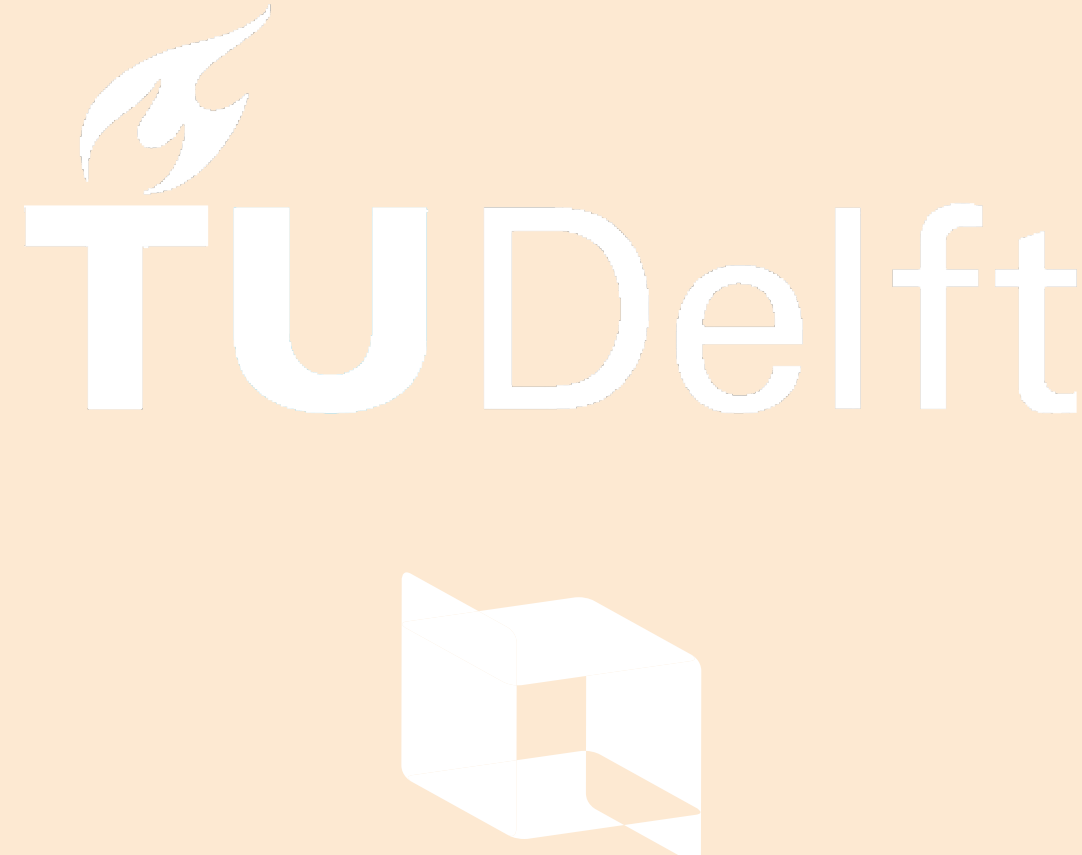


Life Cycle Costs of Transformation

An LCC model for developers and investors for comparing the costs and benefits of different intervention strategies for vacant office building

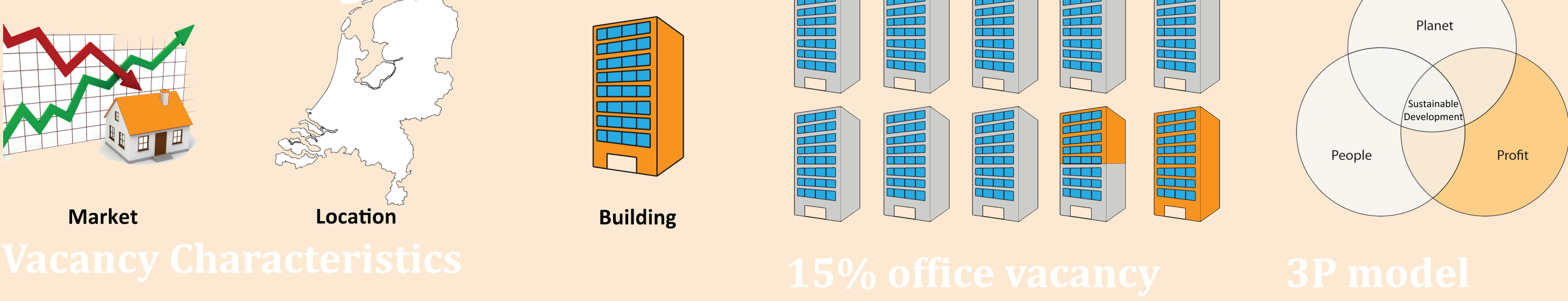


MAARSENGROEP
vastgoedinvesteren

igg bouweconomie.
bointon de groot

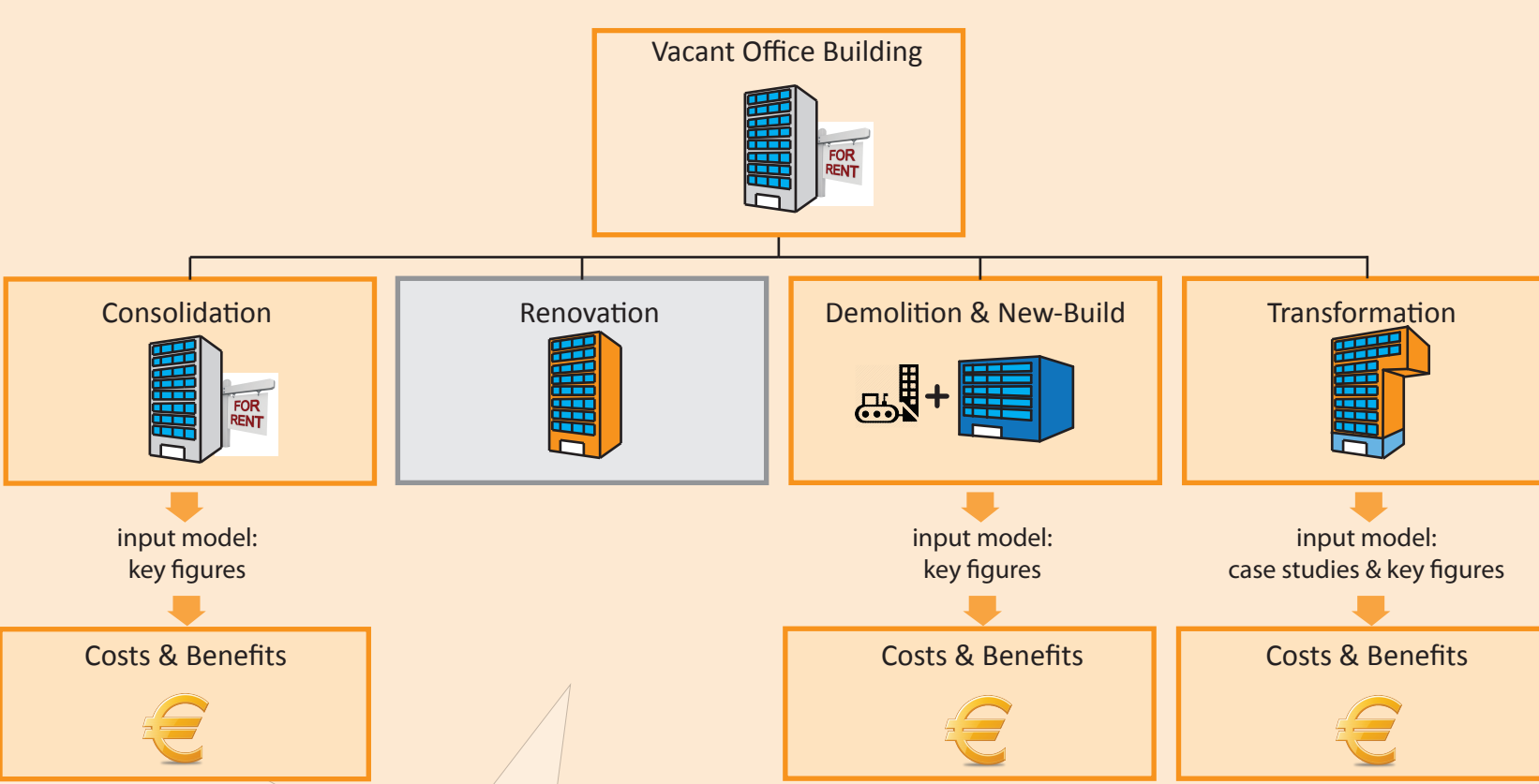
Jelle de Groot

Theory



In the Netherlands there is about 16 million m² of vacant real estate. This consists of different types of real estate like churches, schools, and offices. The vacant office buildings play a large role in the total vacancy problem and is the focus of my research.

The 7 million m² could fit almost 90,000 housing units (just the offices). These 90,000 units is twice the annual total current construction production. Transformation could therefore solve the vacancy problem and housing problem for significant part.

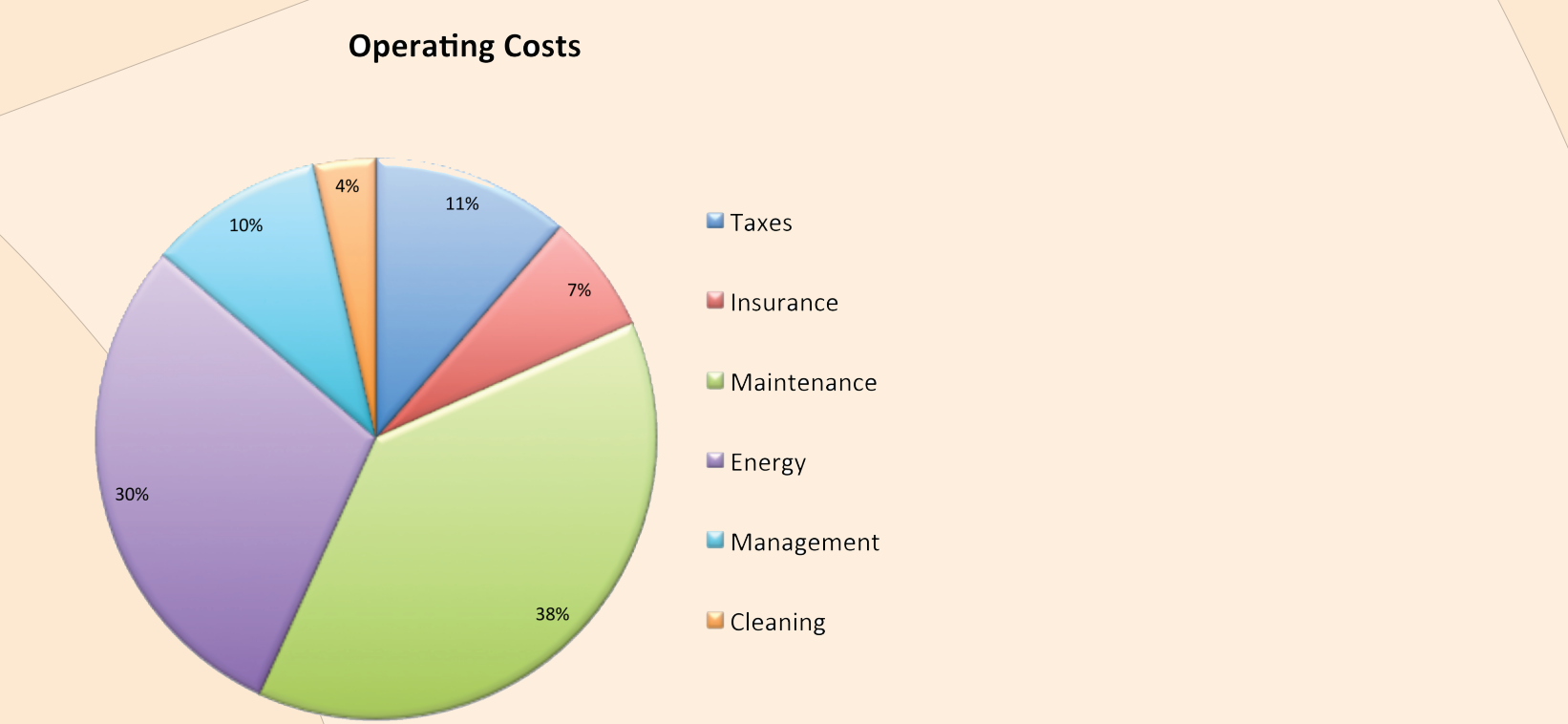
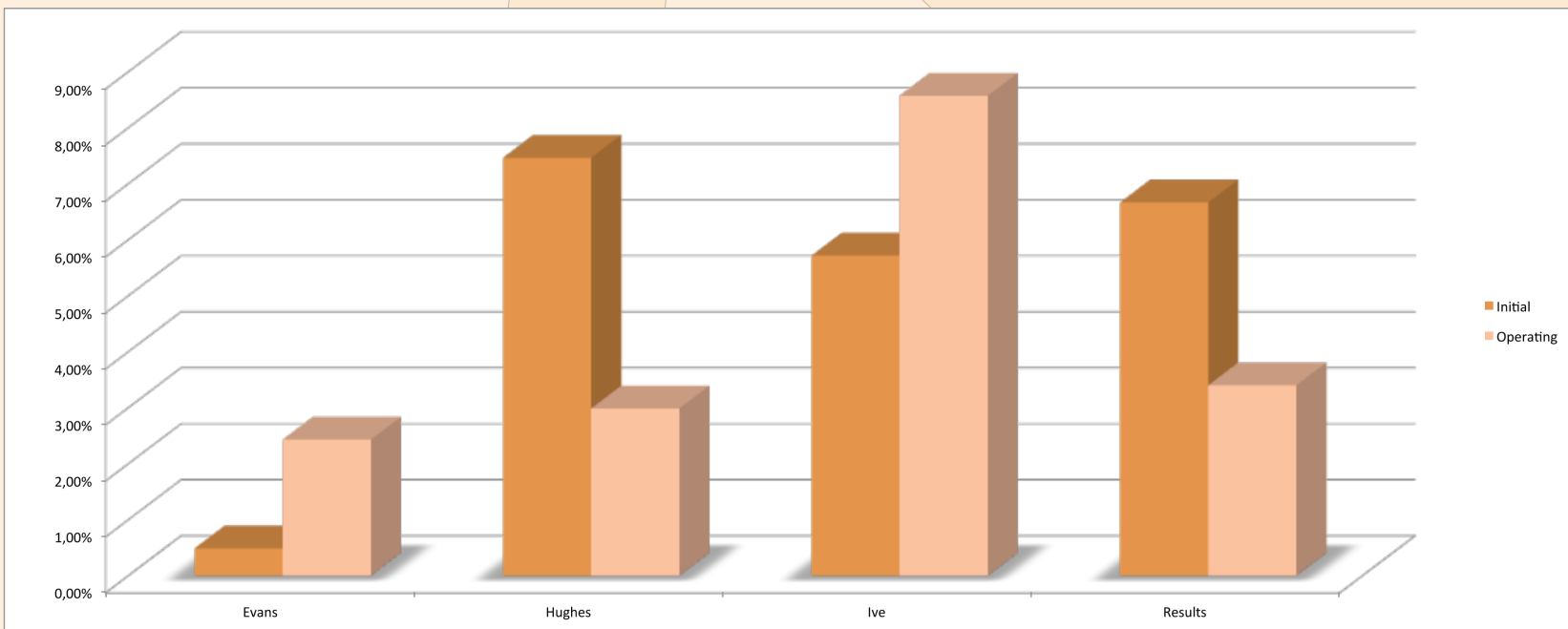


Empirical Research

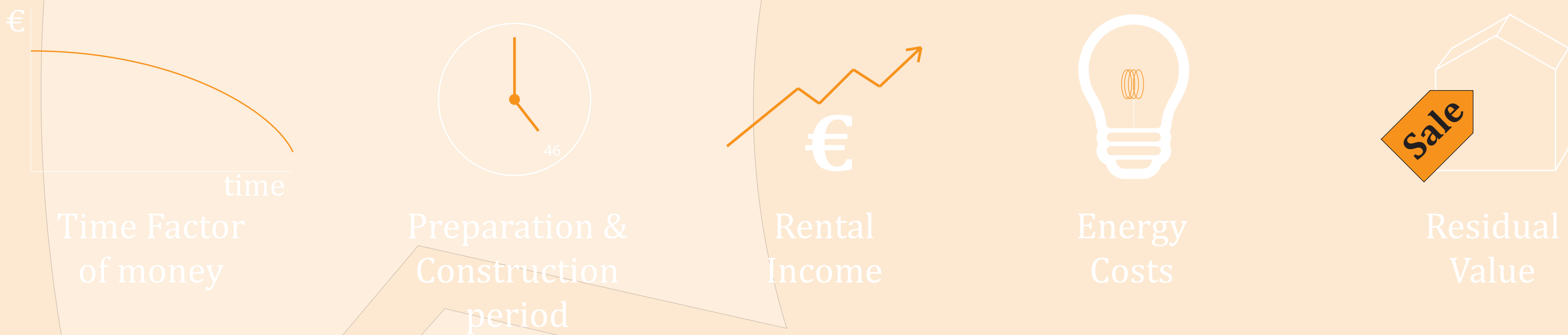
Case Studies



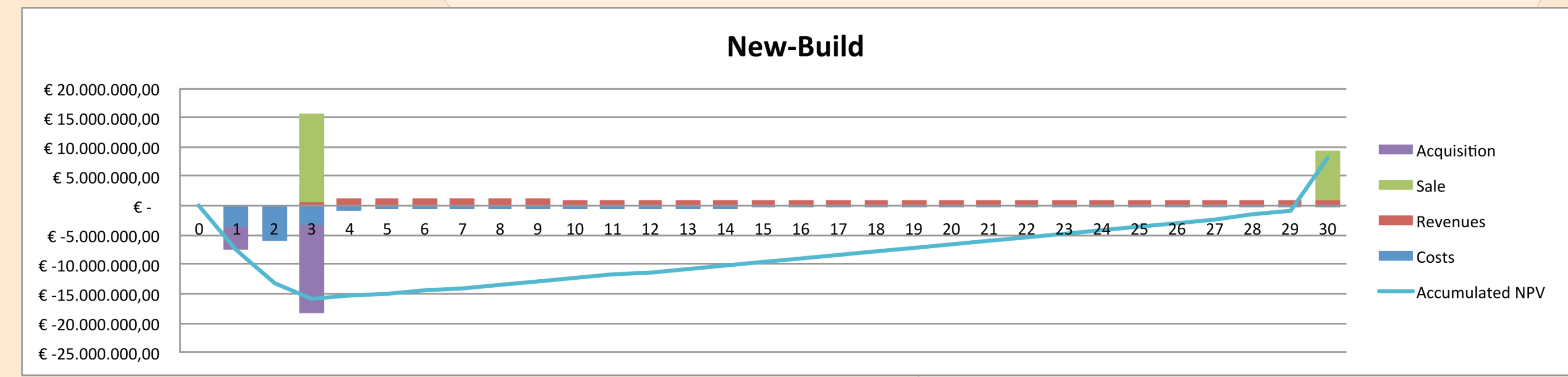
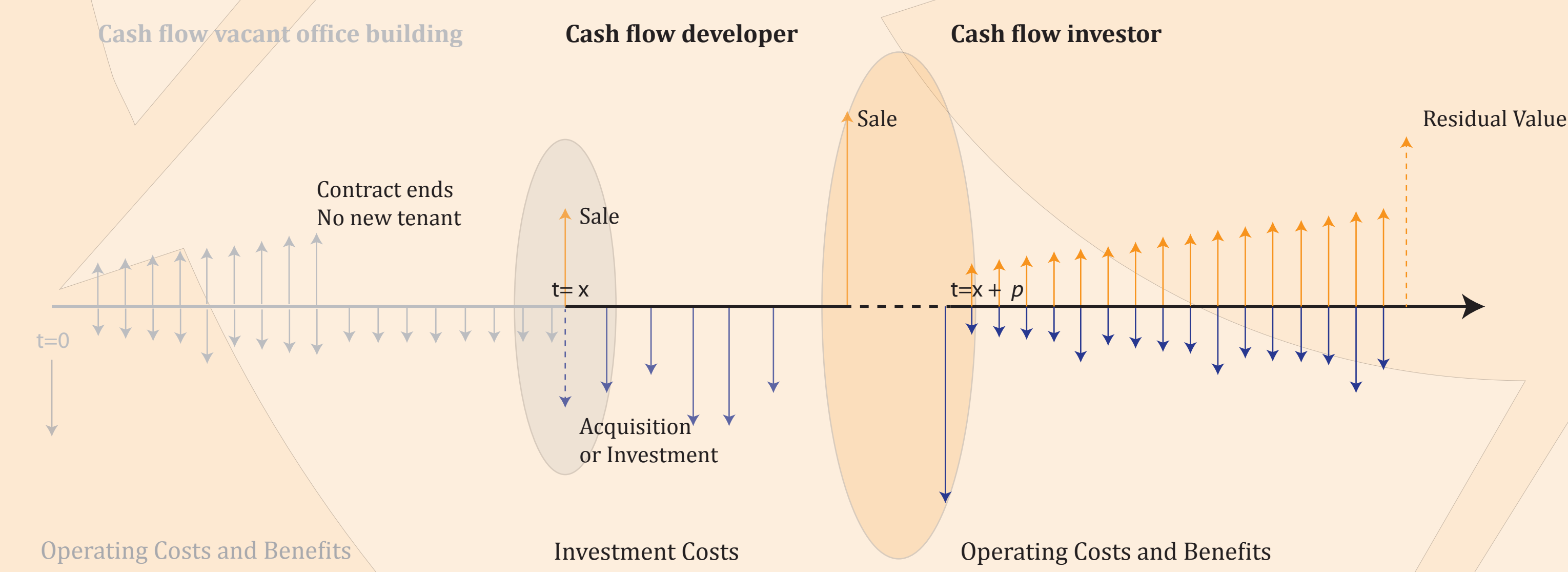
Ratio Investment/Operating



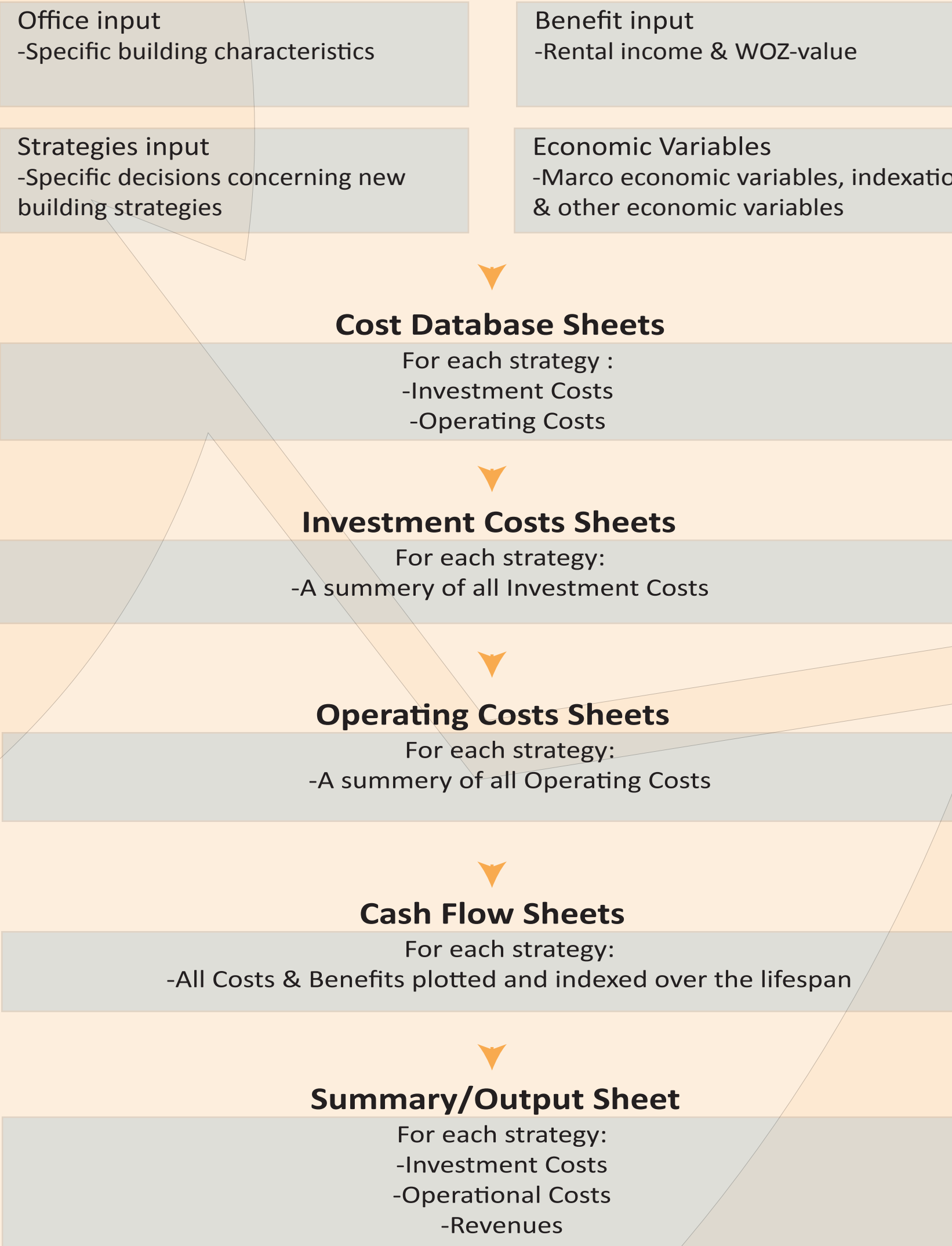
Variables



LCC model



Sheets LCC model



	Transformation	Demolition & New-build	Consolidation
	D	A+	G
Energy Label	D	A+	G
Total Investment Costs	€ 15,160,830.05	€ 16,735,724.26	€ 9,625,637.87
Investment Costs / GFA	€ 1,881.89	€ 1,998.30	€ 541.14
Total Operating Costs / year	€ -914,436.29	€ -881,529.23	€ -2,114,409.77
Total Operating Costs (30 years)	€ -9,433,088.77	€ -11,445,876.63	€ -63,432,098.08
Operating Costs / GFA / year	€ -37.54	€ -45.56	€ -315.58
Operating Costs / GFA (30 years)	€ -1,126.34	€ -1,366.67	€ -9,467.48
Ratio Operating / Investment	0.60	0.68	17.50
Potential Value (GIY)	€ 21,610,761.69	€ 22,052,668.69	€ 3,908,333.33
Result (year 0)	€ 5,288,960.74	€ 5,316,944.40	€ 282,695.46
Total Revenues / year	€ 1,041,823.02	€ 1,515,720.28	€ -2,280.11
Total Revenues (30 years)	€ 31,254,690.71	€ 45,471,608.38	€ -68,403.37
Revenues / GFA / year	€ 124.40	€ 180.98	€ -0.34
Revenues / GFA (30 years)	€ 3,731.90	€ 5,429.45	€ -10.21
Residual value	€ 7,422,535.64	€ 8,479,332.82	€ -68,403.27
LCC € / GFA / year	€ 25.28	€ 71.39	€ -333.96
LCC € / GFA (30 years)	€ 6,352,602.23	€ 17,937,865.02	€ -67,126,135.23
NPV	€ 8.42%	€ 7.52%	€ 9.56%
IRR	8.42%	7.52%	9.56%
ROI	8.42%	7.52%	9.56%