Penelope Pocket Phones

First-Generation Investment and Real-Options Valuation

Corporate Finance — Case Write-up

June 12, 2026

MEMORANDUM

To: Senior Management, Penelope Pocket Phones
From: Jayati Vyas
Date: June 12, 2026
Subject: First-Generation Pocket Phone — Investment Recommendation

Penelope's first-generation pocket phone does not justify its cost on a conventional basis. Discounted at the project's 14.8 percent cost of capital, its projected free cash flows are worth about $6.6 million against the $10 million required to build it, a negative net present value of roughly $3.4 million (Exhibit 1). Judged as a stand-alone product, the project should be rejected. We recommend that Penelope proceed nonetheless, because the first generation is better understood as a platform than as a product. Launching it preserves the right to abandon the effort if demand disappoints and, far more consequentially, creates the right to invest in a much larger second-generation phone several years out. Once that optionality is priced, the launch is justified provided management believes the second-generation opportunity is worth at least about $25.7 million today.

The base case is deliberately unflattering, and that is its purpose. Free cash flow is built from projected earnings, with depreciation added back and the investment in working capital recovered in the final year; discounting the 2002 through 2006 flows at 14.8 percent — the rate implied by a 10 percent risk-free rate, an unlevered beta of 1.2, and a 4 percent market risk premium — yields a project value of $6.6 million (Exhibit 1). Netting the $10 million outlay leaves the project about $3.4 million underwater. That figure, however, assumes Penelope commits the full investment and then carries the project to the end of its life no matter how the market develops. Both assumptions are too pessimistic, because management can in fact respond to what it learns.

The first source of overlooked value is the ability to walk away. If demand proves weak, Penelope can abandon the project in its second year and recover a salvage value of $4 million — in effect an abandonment put on the project's worth. Modeling project value on a two-step binomial tree, in which value rises 64.9 percent or falls 39.3 percent each year (a risk-neutral up-probability of 0.47), only the worst path matters: in the low-low state project value falls to roughly $2.4 million, well below the $4 million the firm could recover by exiting (Exhibit 2).
Discounting that payoff back through the tree at the 10 percent risk-free rate values the abandonment right at about $357,000, which lifts the project's net present value to roughly negative $3.0 million. The flexibility is genuine but modest — sensible downside insurance rather than a reason, on its own, to invest.

The decisive value is strategic and lies in the second generation. Committing to the first-generation phone gives Penelope the right, but not the obligation, to invest in a far larger second-generation project roughly four years out, and that right behaves like a call option. We value it with Black-Scholes, treating the $100 million future investment as the exercise price, with four periods to expiration, annual volatility of 50 percent, and a 10 percent risk-free rate; the present value of the exercise price is about $68.3 million (Exhibit 3). Because the current value of the second-generation cash flows cannot be observed directly, we solve the problem in reverse and ask how large that value would have to be for the growth option to be worth exactly enough to offset the first generation's $3.4 million loss. The answer is about $25.7 million. That number is the hurdle: it is the minimum present value the second-generation opportunity must carry today for Penelope's combined, strategic net present value to break even.

Taken together, the three steps reframe the decision. On its own the first generation loses about $3.4 million; the abandonment option recovers roughly $0.4 million of that; and the growth option on the second generation more than covers the remainder so long as that second opportunity clears the $25.7 million bar. We therefore recommend that Penelope launch the first-generation phone, treating it as the entry cost of a strategic position rather than as an investment that must stand on its own cash flows, on the condition that management's own assessment of the second-generation market supports a present value above roughly $25.7 million. Given that the second generation is expected to require a $100 million investment — implying a substantial addressable market — that condition is plausible, but it is a forward-looking judgment that should

be tested before the money is committed. The recommendation is also sensitive to the assumed 50 percent volatility, which drives much of the growth option's value; a materially lower figure would raise the hurdle. The right decision rests on the strength of the second-generation prospect, not on the first generation's stand-alone numbers.

Summary of Valuation Results ($000s)

Valuation basis	**Net present value**
Base-case DCF (first generation only) — Exhibit 1	(3,370.1)
With abandonment (put) option — Exhibit 2	(3,012.8)
Add second-generation growth (call) option — Exhibit 3	+3,370.1
Combined strategic NPV at break-even (P ≈ $25,704)	**≈ 0.0**

Note: Detailed calculations for Exhibits 1–3 are contained in the accompanying workbook.