

W H I T E P A P E R

Independent Cost Studies and the SIP Advantage:

A Source-Quality Review of Available Cost Comparison Data

Separating Independent Evidence from Industry Marketing

Published by NorthEast SIPs | August 2026

1. Executive Summary

Cost claims about structural insulated panels (SIPs) versus conventional stick framing are easy to find and hard to verify. Nearly every widely circulated figure — "55% labor savings," "SIPs cost 3–7% more," "twice as fast to install" — traces back to a small number of sources, and most of those sources are SIP manufacturers, SIP trade associations, or studies those groups commissioned. That does not make the figures false. It does mean they should be weighed differently than data produced by parties with no financial stake in the outcome.

This white paper reviews the publicly available cost-comparison literature on SIPs versus stick framing, sorts it by source independence, and summarizes what each tier of evidence actually supports. Three conclusions emerge:

- ▶ Genuinely independent, peer-reviewed cost data is scarce. The strongest candidates are a small number of university theses and academic case studies; no large-sample, unaffiliated cost study of SIPs vs. stick framing appears to exist in the public record.
- ▶ Industry-funded studies are directionally consistent even when their magnitudes vary. Labor and schedule savings in the 30–65% range and material cost premiums in the 0–30% range show up repeatedly across manufacturer- and association-sponsored sources, which is reassuring even though none of them is independent.
- ▶ The single biggest driver of disagreement between sources is scope, not bias — whether the comparison is limited to framing materials, includes labor, or extends to total installed cost across the trades affected by the building envelope.

2. Purpose and Scope

This document was prepared to answer a specific question: are there cost studies comparing SIPs and stick-built construction that were not produced or funded by a party with a financial interest in the result? It catalogs the available literature, classifies each source by its degree of independence, and summarizes the cost and schedule figures each one reports.

The scope is limited to cost and schedule comparisons for wall and roof envelope construction in low-rise residential and light commercial buildings. Energy-performance and structural-performance literature is referenced only where it bears directly on lifecycle cost claims; it is not the focus of this paper.

3. Methodology: A Framework for Evaluating Source Independence

Sources were grouped into three tiers based on who authored the work and who funded it:

- ▶ Tier 1 — Independent academic research. Authored by university researchers or students as coursework or thesis research, with no identified funding or editorial involvement from a SIP manufacturer or trade association.
- ▶ Tier 2 — Third-party-executed, industry-sponsored research. Conducted by an independent research or engineering firm using its own methodology, but commissioned and paid for by a SIP-industry sponsor.
- ▶ Tier 3 — Industry association and manufacturer data. Published directly by SIPA (the Structural Insulated Panel Association) or by individual SIP manufacturers, drawing on their own project files, customer case studies, or in-house tools.

This tiering is a proxy for independence, not a judgment of accuracy — a well-run Tier 2 or Tier 3 study using real project data can still be informative, and a Tier 1 source can still have small-sample limitations. The tier simply indicates how much weight a skeptical reader — an architect, code official, or competing builder — should reasonably assign before independently verifying the numbers.

4. Tier 1 — Independent Academic Research

4.1 University of Colorado Boulder — "The True Cost of SIPs"

This undergraduate honors thesis builds a cost-matrix tool comparing SIPs to stick framing across nine common residential building elements, using point-in-time material and labor pricing across six major cost categories. Its central question is whether small-scale homes — which do not benefit from the economies of scale that make SIPs more competitive on larger projects — can be built with SIPs at cost parity with stick framing. The thesis finds that at small scale, cost-based design decisions are needed to offset the loss of that economy of scale; SIPs are not automatically cost-competitive on a small home without deliberate design choices.

- ▶ Independence: no identified SIP-industry funding; produced as university coursework.
- ▶ Scope: material square-foot cost across nine building elements, three example home designs.
- ▶ Limitation: single-author undergraduate work, not peer-reviewed in the academic-journal sense, and now over a decade old — material and labor pricing will not reflect current markets.

4.2 Penn State — Architectural Engineering Senior Thesis (Holiday Inn Express, Absecon, NJ)

A construction-management senior thesis analyzed substituting SIP wall panels for stick-built framing on a hotel project, comparing R-value, schedule impact, and electrical/plumbing labor. As a single-project case study of a commercial building rather than a residential one, its findings are illustrative rather than broadly generalizable, but it is independently authored academic work rather than industry marketing.

- ▶ Independence: university coursework; no identified sponsor funding.
- ▶ Scope: one commercial building, framing and MEP labor impact only.
- ▶ Limitation: single project, single building type, dated (2010).

5. Tier 2 — Third-Party-Executed, Industry-Sponsored Research

5.1 RS Means (Reed Construction Data) Time & Motion Study

RS Means, a long-established independent construction cost-data firm, conducted a side-by-side case study of two Habitat for Humanity homes — one built with SIPs, one with conventional wood framing — examining labor productivity, cycle time, worker safety, workmanship, material waste, and equipment requirements. The study reports that SIPs reduced site framing labor for walls and roofs by roughly two-thirds, with cycle time savings of similar magnitude, and found no significant difference in the other performance metrics measured, aside from the SIP crew requiring a lift truck and crane.

- ▶ Independence: RS Means is a respected, methodologically independent cost-data firm — but the study was commissioned by BASF, a SIP core-material supplier, which funds and has commercial interest in the outcome.
- ▶ Scope: framing-phase labor and cycle time on two comparable Habitat for Humanity homes; not a broad multi-project sample.
- ▶ How to use it: treat the labor-hour methodology as credible (RS Means' normal practice), but treat the ~55–65% labor-savings figure as representative of this specific pairing, not a universal constant.

6. Tier 3 — Industry Association and Manufacturer Data

The majority of publicly available SIPs-vs-stick cost content falls into this tier. It is the least independent but the largest and most current body of data, and it is directionally useful once its provenance is disclosed.

6.1 SIPA True Cost Bidding Tool and Project Library

The Structural Insulated Panel Association (SIPA) publishes a free online cost-comparison tool developed with the retired chief architect of the U.S. Department of Energy's Energy Star program, along with a library of hundreds of real project examples. SIPA's own materials report a straight material-cost premium for SIPs of roughly 11% on one documented multifamily project, offset by trade, financing, and time savings once those are added into the comparison, and by additional value when a design is optimized specifically for SIPs.

- ▶ Independence: SIPA is the SIP industry's trade association; the tool and library exist to promote SIP adoption.
- ▶ Value: real, named projects with itemized categories (materials, then materials + trade/financing savings, then optimized-design value) are more transparent than a single blended percentage, which makes the underlying assumptions easier to check.

6.2 Manufacturer Case Studies and Cost Ranges

Individual SIP manufacturers publish their own project case studies and rule-of-thumb cost ranges. Figures vary considerably by manufacturer and by how "cost" is scoped:

Source	Reported figure	What it measures
Premier SIPS (Prairie Lofts project)	+11% material premium; net value positive once trade/time savings included	Multifamily project, materials only vs. full-scope comparison
Premier SIPS (production builder case study)	8 days vs. 12 days envelope framing	2,500 SF single-story home, framing duration only

Source	Reported figure	What it measures
ACME Panel	SIPs 3–7% more at code-minimum standard; cost-competitive or lower at higher performance tiers	Whole-house build cost, code-min vs. performance build
EnerSmart Systems	0–30% more for SIP walls vs. stick-framed walls	Wall assembly only, not whole-building cost
PGS Consulting	Wall framing 30–50% faster; roof framing 50–70% faster	Labor/schedule, 30-year lifecycle framing

Table 1. Representative manufacturer- and association-published cost and schedule figures. All sources are industry-affiliated (Tier 3); figures are shown as originally published and have not been independently verified.

- A frequently cited example: SIPA reports factory-cut electrical chases saved roughly \$1 million on a Las Vegas elementary school project through reduced on-site electrical labor — a single commercial case, not a repeatable average.

7. Synthesis: What the Range of Evidence Shows

Read across all three tiers, two patterns hold up despite the difference in source independence:

Metric	Range reported	Tiers reporting it
Framing labor/schedule savings	30% – 65% faster or fewer labor-hours	Tier 1, Tier 2, Tier 3
Material cost premium (envelope only)	0% – 30% higher than stick framing	Tier 2, Tier 3
Whole-building cost at code-minimum spec	3% – 7% higher than stick framing	Tier 3
Whole-building cost at high-performance spec	Cost-competitive to lower than stick framing	Tier 3
Material waste on site	Substantially lower (SIPA cites 1–3% vs. 10–20%)	Tier 3

Table 2. Synthesized ranges across all reviewed sources. Where only Tier 3 sources report a figure, treat it as directional rather than verified.

The consistency of the labor/schedule-savings direction across independent, semi-independent, and industry sources — even though the exact percentage varies — is the most defensible claim in this literature. The cost-premium figures are more sensitive to scope and are supported by thinner, less independent evidence.

8. Why Estimates Vary So Widely

The spread between "SIPs cost 30% more" and "SIPs cost the same or less" is not primarily a story of dishonest marketing on one end and rigorous science on the other. Four factors explain most of the variation:

- Scope of comparison. A material-only comparison of SIP panels against dimensional lumber will almost always show SIPs costing more; a total-installed-cost comparison that includes labor, waste, financing carry costs, and downstream trades regularly narrows or reverses that gap.

- ▶ Design standard. Code-minimum stick framing is genuinely the cheapest way to enclose a building; SIPs compete on cost only once the comparison point is a home built to a similar performance standard (airtightness, R-value, resilience).
- ▶ Project scale. Small residential projects do not benefit from the economies of scale that spread SIP manufacturing setup costs — the CU Boulder thesis is explicit on this point — while larger or repeat-build projects see costs compress.
- ▶ Regional and time-period pricing. Lumber and foam-core pricing are both volatile; a study conducted during a lumber price spike will show a very different comparison than one conducted during a foam-cost spike, and none of the studies reviewed here share a common pricing baseline.

9. Total Installed Cost vs. Material Line-Item Cost

Nearly every source in this review — independent and industry alike — makes the same structural point: comparing SIP panel price to lumber price is not a cost comparison, it is a materials-price comparison. A defensible cost comparison has to account for at least four categories that a line-item material comparison omits:

- ▶ Labor hours and crew size for framing, which multiple sources across all three tiers report as substantially lower for SIPs.
- ▶ Construction cycle time, which affects financing carry costs, site security, and weather exposure risk during the framing phase.
- ▶ Downstream trade costs, including HVAC equipment sizing (a tighter envelope can allow smaller mechanical systems) and electrical labor (pre-cut chases reduce field drilling time).
- ▶ Material waste and callbacks, which several manufacturer sources report as lower for factory-built panels versus field-cut lumber, though this is the least independently verified category.

None of the reviewed sources — including the independent Tier 1 studies — produce a single, universally applicable "total installed cost" percentage. The CU Boulder matrix tool and the SIPA True Cost Bidding Tool both exist precisely because total installed cost has to be calculated per-project; it is not a fixed multiplier.

10. Practical Implications for Buyers and Specifiers

- ▶ Treat any single-percentage cost claim — from any source, including SIP manufacturers — as a starting point for questions, not a number to design a budget around. Ask what is included: materials only, or materials plus labor plus downstream trades?
- ▶ Request project-specific comparisons over generic industry figures. A cost matrix or bidding tool applied to the actual design, actual local labor rates, and actual current material pricing will always be more reliable than a published range.
- ▶ Expect the cost story to change with project scale and performance target. A code-minimum small home and a high-performance mid-size project are not the same comparison, and citing one to support a conclusion about the other is a common source of confusion in this literature.
- ▶ Where a claim rests on a single case study (a single school, a single production-builder home), read it as an existence proof that a result is achievable, not as a statistical average.

11. Source Quality Caveats and Recommendations for Further Research

This review found no large-sample, peer-reviewed, unaffiliated cost study directly comparing SIPs and stick-built construction across multiple projects. The strongest independent evidence — the CU Boulder and Penn State theses — is small-scale academic work, useful for its transparent methodology but limited in sample size and, in the CU Boulder case, dated pricing. The RS Means/BASF study benefits from an independent research firm's methodology but was commissioned by an industry sponsor. The remainder of the available literature is published directly by SIP manufacturers or their trade association.

For a reader who needs a genuinely independent, current cost comparison, the most reliable path is not an existing published source but a project-specific analysis: obtaining competitive bids for both a SIP and a stick-framed version of the same design, from the same general contractor where possible, using current local material and labor pricing. Absent that, the SIPA True Cost Bidding Tool and the CU Boulder cost matrix are the two publicly available tools that at least make their assumptions and categories explicit enough to be checked line by line, even though neither is independent of the industry.

12. References

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