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HOW IS THE CONSTRUCTION INDUSTRY PERFORMING? INSIGHTS FROM FOUR YEARS OF MEASUREMENT

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ABSTRACT

The purpose of this paper is to report the results from the second, third, and fourth year of measurement of performance metrics set by Building 2030 consortium. The first year of measurement was reported in the International Group of Lean Construction Conference 2022. The broader question the authors are seeking an answer is: Lean construction practices have been trained, tested, and implemented for many years in the Finnish construction industry but has the industry improved performance?"

During the measurement period the number of projects included in measurement has increased. All metrics related to reliability have increased during the measurement period; considering the unexceptional environment with the pandemic and an overheated construction market, the authors were expecting a decline in these metrics. There has been an emphasis on decreasing project duration through implementation of takt production. It was interesting to notice that this has not yet been reflected on average durations, likely because the average project size has increased. Also, all sustainability metrics have improved. In conclusion, the industry seems to be improving performance but longer time intervals of robust data will be needed to identify a trend. The Building 2030 consortium intends to continue to annually collect the performance metrics.

KEYWORDS

benefits realization, continuous improvement, lean construction, benchmarking

INTRODUCTION

This paper is a follow-up on the paper that was published in the International Group of Lean Construction Conference 2022 (Elfving & Seppänen, 2022), where the authors sought to answer the following question: "Lean construction practices have been trained, tested, and implemented for many years in the Finnish construction industry but has the industry performance improved?" Unfortunately, except for safety data, there has been very little comparable industry level data to show construction performance (exceptions include Construction Industry Institute CII benchmarking system, Lee et al., 2005). Therefore, a joint industry and academia consortium Building 2030 agreed to start an annual benchmark to assess longitudinal industry performance development in Finland. Companies share project data that Aalto researchers summarize and utilize to calculate metrics that are not available in other, publicly collected industry data sources.

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The metrics were defined based on the five themes of the published vision of the consortium (see Elfving & Seppänen, 2022 for the selection criteria of the metrics). Key part of the vision was to show that construction industry is a reliable partner. This was measured by evaluating share of projects with zero defects at commissioning, share of projects with zero accidents, share of projects finishing on time and on budget. The consortium wanted to increase the share of collaborative contracts to make buildings more user-centric. Sustainable development goals were measured by average recycling rate, share of projects with good energy efficiency (class A or B in the Finnish system) and share of projects with environmental certification. Productivity was found hard to directly measure on project level but construction duration by project type was used as a proxy because the goal of consortium companies was to significantly decrease project durations by lean and digital interventions. Earned value in euros / week was later added to original metrics because it was found that project sizes were not comparable in all years. Wide adoption of lean practices such as takt production, collaborative contract forms, just-in-time logistics, Target Value Delivery and increased digitalization of construction sites should eventually impact these metrics on industry level.

The first-year results were published in Elfving & Seppänen (2022), in which the authors, in addition to presenting the results from the first measurement, provided the background for the need of measurement, as well as a literature review of industry level metrics and previous benchmarking initiatives. These are briefly reviewed in the following section. Since it was the first year of measurement, it was too early to answer the fundamental question; "Has the Finnish construction industry improved performance?". Even though the main conclusion of the paper was that more data is needed to identify trends, some interesting observations could be made, e.g., high schedule reliability compared to previously reported studies in other countries, and high Net Promoter Scores (NPS) compared to other industries. One of the weaknesses of the data was that the project categories used in the reporting were not granular enough for proper comparisons – this has been now improved by dividing the commercial segment into several subcategories.

The aim of this paper is to present results from the second, third, and fourth year of performance measurement and compare them to the first-year results. In the discussion chapter the authors present the most prevalent findings and purpose topics for further research.

COMPARISON TO PREVIOUS BENCHMARKING INITIATIVES

In the preceding study (Elfving & Seppänen, 2022) the authors reviewed previously reported benchmarking initiatives. The gaps presented then are still valid, with the following key points: First, several benchmarking approaches rely on surveys filled by projects which voluntarily participate in study (e.g., Kim, 2014, Bonilla & Castillo, 2020) that result in a possibly biased sample of projects that choose to participate in the survey, failing to provide reliable industry level metrics. Second, the data collection process should be simple and non-time consuming (e.g., Costa et al., 2006) which benchmarking initiatives often lack, resulting in fatigue and failure to continue providing data over the long term. Third, several benchmarking groups have been formed (e.g., CII, Lee et al., 2005) but due to constantly changing members and thus unstable data pool, the results might lack consistency in assessing true industry development over time. Overall, although such benchmarking initiatives are valuable in motivating organizations to improve, they do not effectively provide objective understanding on longitudinal developments of the industry-level metrics.

The benchmarking initiative of Building 2030 consortium addresses these gaps by involving a group of companies with large share of construction volume in Finland and asking them to provide a sample of projects. Because the projects are not directly contributing data, the benchmarking is limited to data that are easily available in company databases for all projects. This does not allow going deep into root cause analysis for individual factors but enables tracking industry development longitudinally and on a larger scale, as lean and digital methods are implemented by participating companies.

METHOD

The latest measurement was based on projects finished in 2023. It included 122 projects, totalling 1,7 billion euros in value. The average project value was 14 M€. Large projects over 50 M€ were excluded in the data request because some outliers (a few very large projects that skewed the results and deemed to be non-comparable) were detected in 2020 data. Based on the measurement experiences of the first year, modifications were made to the categorization of project types. The residential segment was left as is (68 projects) but the commercial segment was subdivided to offices (n = 7), school/daycare (n= 15), parking structures (n=8), retail buildings (n=7) and infrastructure (n=7) to allow more precise comparisons.

The data was collected by asking Building 2030 consortium companies to provide a sample of projects that were finished in 2023: more specifically, the data was collected from six general contractor members of the consortium. This was supported by researchers providing a spreadsheet to be filled with project details, including project information and measurements related to metrics described above. Comparison of collected data, including also projects finished in 2021 and 2022, is shown in Table 1.

Table 1: Comparison of data between measurements

Data type	2020	2021	2022	2023
Total number of projects	58	151	103	122
Total value of projects	1,1 B	1,8B	0,9B	1,7B
Average size of projects	19 M	12 M	9 M	14 M
Residential	24	79	87	68
Commercial	31			
Offices		8	2	7
School/daycare		25	4	15
Parking structure		5	3	8
Retail buildings		15		7
Infrastructure	3	15	7	7
Participating companies	5	8	6	6

RESULTS

The consortium is following an overall scorecard of metrics to evaluate progress (Table 2). Especially good results have been achieved on “Finished on schedule” metric, which is based on substantial commissioning on agreed date, including possible agreed time extensions. Other reliability metrics have remained on similar levels. Energy efficiency of buildings has improved so that 71% of buildings get one of the two highest energy (A or B) classifications. There is a noticeable increase in the share of projects which get environmental certification, such as BREAAM, LEED or Finnish certificate RTS. In 2020 and 2021, many projects were not able to report recycling rates accurately. Data were missing from many projects, and companies which reported the figures often misunderstood what was meant by recycling – also waste burned for energy use was classified recycled. In 2022, the consortium companies started to report accurate numbers, and the recycling rate has since increased.

Consortium companies engage heavily in multi-family residential construction, and the overall results and consortium’s target for 2030 of residential construction are shown in Table

3. The project classification has remained the same since the beginning. The consortium companies have increasingly implemented takt production in the last years in their residential projects. It should be noted that the market was overheating until 2022, and then the volume has drastically diminished (36% decrease in 2023 and expected 26% decrease in 2024; Rakennusteollisuus 2024). This is seen in the increasing size of projects finishing in 2023 – almost no new projects were started, so data included in the sample included larger projects which had started already before the downturn.

Table 2: Overall scorecard.
***Recycling rates of 2020 and 2021 have reliability issues (refer to text).*

Metric	2020 (n=58)	2021 (n=151)	2022 (n=103)	2023 (n=122)	Target 2030
Zero defects at commissioning	36%	53%	59%	48%	100%
Zero accidents	53%	47%	60%	52%	100%
Finished on schedule	81%	91%	93%	89%	100%
Finished on budget	52%	66%	59%	46%	100%
Collaborative contract form	35%	23%	8%	19%	Not set for residential
Recycling rate	72%**	66%**	43%	53%	90%
Energy classification A or B	51%	59%	71%	71%	80%
Environmental certification	11%	6%	5%	27%	50%
Construction duration (residential)	66 weeks	71 weeks	67 weeks	89 weeks	Mean 40 weeks (at 10 M€ budget)
Construction duration (others)	66 weeks	71 weeks	70 weeks	72 weeks	Not set for others
Earned value € / week	175 524	167 278	133 952	175 319	Not set
Share of direct work	22%	N/A	N/A	N/A	40%

It can be said that progress has been made by the consortium on several fronts. Reliability metrics have improved for all metrics except safety and cost. The dip in 2021 in safety metrics can be attributed to the overheating of the market. Interestingly, overheating of the market and supply chain problems caused by COVID-19 did not cause problems with budget that year but the impact can be seen in 2022 and 2023. Although the share of collaborative projects went up during the strong residential construction market of 2021, it decreased significantly in 2022 and 2023, potentially due to the market downturn.

The share of high-rate energy classifications and environmental certifications has also increased. The consortium year 2030 target for energy classification A or B was achieved already in 2021 and due to market demand, all projects achieved that level of energy efficiency in 2023. During measurement time, environmental certifications for residential projects went from 0% to 25% due to strategic decisions in some consortium companies.

The average construction duration target (from foundations to handover) was set to 40 weeks at 10 million EUR budget. However, due to no new projects starting in 2023, the last data point includes much larger projects (that continue from the previous years), so the measured average duration in 2023 is not directly comparable to previous years. Thus, the decrease in cycle times can be better seen in value of construction achieved in a week, which has increased from 125 000 EUR to 163 000 EUR during the time period. Consortium companies have heavily implemented takt production in their residential construction projects which explains the 96% success rate of finishing in schedule and increased earned value on weekly basis. Thus, the construction duration metric is expected to continue improvement in future measurements. Share of direct work will be measured again in 2024 measurement.

Table 3: Comparison of multi-family residential projects.
***Recycling rates of 2020 and 2021 have validity issues (refer to text).*

Metric	2020 (n=24)	2021 (n=79)	2022 (n=87)	2023 (n=68)	Target 2030
Zero defects at commissioning	42%	63%	61%	56%	100%
Zero accidents	71%	51%	62%	57%	100%
Finished on schedule	83%	96%	95%	96%	100%
Finished on budget	50%	72%	60%	46%	100%
Collaborative contract form	17%	23%	5%	4%	Not set for residential
Recycling rate	70%**	62%**	43%	54%	90%
Energy classification A or B	63%	84%	78%	100%	80%
Environmental certification	0%	3,8%	3,4%	25%	50%
Construction duration	66 weeks	71 weeks	68 weeks	82 weeks	Mean 40 weeks (at EUR 10 million budget)
Earned value € / week	154 545 €	125 499	126 901	163 444€	Not set
Share of direct work	21%	N/A	N/A	N/A	40%

There are large differences between different types of commercial buildings: especially office buildings and school / daycare buildings were performing worse than other building types. Due to space limitations, we focus on reporting results for those outlier project types, offices in Table 4 and schools in Table 5. The number of these projects is much smaller than residential projects, which causes more fluctuations between the values year to year. For example, in Table 4, it seems energy classification has decreased in 2023.

It can be said that improvements visible in residential construction have not yet been achieved in office buildings. Environmental certification is the only clear indication of improvement. Similarly, schools have challenges with quality, safety and budget, but most schools are finished on time, most likely due to longer schedules caused by the timing of the school year. Improvement is visible in energy classification and environmental certification but not yet in production rates.

Table 4: Comparison of performance for office buildings

Metric	2021 (n=8)	2022 (n=2)	2023 (n=7)	Target 2030
Zero defects at commissioning	50%	0%	29%	100%
Zero accidents	50%	50%	43%	100%
Finished on schedule	83%	100%	57%	100%
Finished on budget	100%	50%	14%	100%
Collaborative contract form	38%	50%	14%	Not set for offices
Recycling rate	69%**	47%	73%	90%
Energy classification A or B	100%	100%	83%	80%
Environmental certification	13%	100%	57%	50%
Construction duration	71 weeks	74 weeks	82 weeks	Not set for offices
Earned value € / week	222 506	200 898	219 886	Not set
Share of direct work	14%	N/A	N/A	40%

Table 5: Comparison of performance for school/daycare buildings

Metric	2021 (n=25)	2022 (n=4)	2023 (n=15)	Target 2030
Zero defects at commissioning	33%	0%	40%	100%
Zero accidents	20%	50%	27%	100%
Finished on schedule	83%	100%	93%	100%
Finished on budget	42%	0%	27%	100%
Collaborative contract form	40%	0%	20%	Not set for schools
Recycling rate	57%**	37%	48%	90%
Energy classification A or B	93%	100%	100%	80%
Environmental certification	31%	0%	60%	50%
Construction duration	87 weeks	70 weeks	86 weeks	Not set for schools
Earned value € / week	183 744	167 703	175 619	Not set
Share of direct work	N/A	N/A	N/A	40%

DISCUSSION

THE AMOUNT OF COLLECTED DATA HAS INCREASED FROM THE FIRST MEASUREMENT

The data from 122 residential and commercial projects in 2023 represents a total value of 1.7 billion euros of projects. Although it is still a low share to draw definitive conclusions over the whole industry, the share has increased since the first measurement in 2020.

Even if the amount of data stays on the current level, it is already possible to start with some deeper analysis and particularly understand why the performance differs between segments. One of the conclusions in the first report (Elfving & Seppänen, 2022) was to separate the commercial building segment further to offices, schools/daycares, parking structures and retail. This turned out to be a good idea because there are clear differences in performance within the category of commercial projects. Currently residential projects are measured as one segment, it may be worthwhile to separate the low-income housing and high-end housing once there are enough data points. In future, infrastructure projects should be similarly further elaborated, because of wide variety of infrastructure projects.

SOME METRICS ARE IMPROVING, ALTHOUGH VARIATION BETWEEN PROJECT SEGMENTS EXIST

The reliability metrics are clearly higher on residential projects than on commercial projects. Residential projects tend to be less complex than commercial projects but there may be other explanations as well. Residential projects have elements of process production, where standard design solutions, standard assembly methods and more stable project teams including long-term supply chain relations are more common than in commercial construction. Also, takt production in residential construction is increasing significantly in Finland, which forces project teams to plan more meticulously than with previously used methods, further driving for improvement.

On the other hand, collaborative contracts in commercial projects have typically a 6–24-month development phase prior to the construction phase, which particularly aims to mitigate risks related to reliability. Therefore, it would be interesting to take a subset from the projects with collaborative contracts and compare the performance measurement against the non-collaborative contracts. Such a study was recently published by Aboseif and Hanna (2023) who found that collaborative contract forms such as IPD and target value projects performed better than more traditional contract forms. The authors propose more research on how collaborative contracts impact performance measures and what kind commercial models would enhance standard design and assembly methods as well as more stable project team and supply chain relations also in commercial projects.

THE ECONOMIC TRENDS HAVE AN IMPACT ON RESULTS

Until 2022 we saw a positive development of all reliability metrics compared to our baseline year 2020. The industry was improving, finally, or was it? During 2023 the Finnish construction market dropped by 16% and the residential construction market by 36% (Rakennusteollisuus 2024). Typically, when the industry falls in recession, there is a negative trend in the reliability metrics, because competition gets fierce, and companies aggressively cut cost. However, there was a drop only in two of the metrics, "Finish on budget", and Zero Accident", while "Zero defects at commissioning" and "Finished on Schedule" have improved compared to the baseline.

What might explain these results? Building 2030 has gotten plenty of publicity, e.g., the main construction trade magazine in Finland, Rakennuslehti (www.rakennuslehti.fi), has regularly published articles about Building 2030. Can it be as simple as what gets measured gets done? Another explanation could be that more project data was available from better performing companies than less well performing companies during 2023 compared 2020. On a larger scale, the economic trends – both downturn and upturns – could have both positive and negative effects for the results. On one hand, recession can, for example, have a positive impact on labour availability and bring pressure to improve performance due to increased competition; but at the same time, reduce the amount of money available for developing new practices and site management. On the other hand, heated markets can provide access to better budget for development initiatives, but companies might fall short in finding time and labour to drive the development initiatives into practice. It will be interesting to see how the metrics evolve after the Finnish construction market will recover from the current downturn.

HIGH SCHEDULE MANAGEMENT COMPETENCE IS A LONG-TERM JOURNEY

The Finnish construction industry has widely utilized location-based-scheduling such as line-of-balance (LOB) and location-based management system (LBMS) since 90s (Kankainen & Seppänen, 2003). The advantage with location-based methods include explicit consideration of production rates and space conflicts, which helps to better optimize schedules and identify when preventive actions are needed. These scheduling methods have been prevalent in Finnish construction management programs from the 90s in Finland.

In 2017, the Building 2030 consortium introduced takt production, the newest iteration of location-based scheduling methods, to the Finnish construction industry. Takt production prioritizes process flow, which should improve reliability and increase productivity. In our data set we can see that the production reliability has steadily improved and is on high level, but the productivity data is not that clear. In 2023, construction durations increased at the same time as value of construction has increased. Although increased production durations are partly explained by the increased average project size, Finnish contractors may still be optimizing resource efficiency of contractors rather than aggressive duration reductions possible with short takt times and small takt areas. To understand the reasons behind improved schedule reliability requires further empirical evidence and research, which also considers external factors such as economic trends.

Due to well established use of location-based methods in the Finnish construction industry, it has not been surprising that takt production has become popular. In 2022, Building 2030 companies estimated that hundreds of projects annually in the participating companies had applied takt production. The number is fast increasing, and takt production is becoming the dominant planning method in Finland, with several large owners starting to require it from contractors.

It is a long journey from pilot projects in each company to wide implementation visible in industry-level metrics. If the takt production development and collaboration between academic and industry follows the pattern as in 1990s with other location-based methods, we expect to see steady improvement in productivity, particularly in construction time reductions on industry level in coming years.

QUALITY IS IMPROVING BUT STILL POOR

The quality metric, "Zero defects at commissioning", has improved from its overall baseline level 2020. The baseline level was low from the beginning so already small things, such as making the metric visible, may have improved it. Another interesting hypothesis that needs further study is the correlation between increased utilization of takt production and zero defects at commissioning. Improvements in reliability of schedules should eventually lead to better quality. In a properly executed takt production project, quality should be checked for each takt area which should eventually be seen in quality metrics.

Although some improvements can be seen, quality metrics are still poor. One reason could be that quality reliability is sacrificed over schedule reliability. That is, projects are "substantially complete" even if defects are not corrected. This requires further investigation. Compared to schedule management, quality management has gotten much less attention in Building 2030 consortium. The consortium has funded six studies on takt production but just one related to quality management.

In the 90s Finland had a big quality movement (Wegelius 1998), introducing concepts such as Total Quality Management (Juran, 1974 and Ishikawa, 1985), SixSigma (Pande et al., 2001), and ISO 9000 quality certificates. These concepts do not appear to drive quality in today's construction industry in Finland. The general knowledge and competence with respect to quality management is lower than in schedule management. If industry practitioners are asked what the key concepts and methods for schedule management are – the answer most probably would be LBMS, the Last Planner® System or takt production. If the same question is asked about quality management probably every company would answer differently and refer to some home-grown method.

The authors propose that Building 2030 consortium should take a larger role in improving quality management through long-term collaborative research and competence development, alike in schedule management. This may also require expanding the consortium to have more trade contractor representatives engaged, since they perform a major bulk of general contractors' work, as well as involving the blue-collar workers more in development.

SUSTAINABILITY METRICS HAVE IMPROVED, HOWEVER, THEIR COLLECTION AND INTERPRETATION REQUIRE CONSTANT AWARENESS

The shares of projects with high-rate energy efficiency classification and environmental certifications have both improved from 2020. Regarding recycling rate, in the provided data the recycling requirements were in some parts misunderstood in 2020 and 2021. However, after the requirements were clarified, the rates have been improving from 2022 to 2023. This misunderstanding also highlights the need for accurate descriptions and clear communication of what is measured, especially regarding sustainability data in general. The reason behind the unreliable sustainability data is partly a cognitive one as people lack awareness and training, but also the constantly changing requirements both when it comes to environmental legislation and various sustainability certifications.

ZERO ACCIDENT DECLINE MAY HAVE CAUSED BY UNUSUAL CIRCUMSTANCES

During 2021 the Finnish construction industry was hit by two unusual circumstances, the COVID-19 pandemic and an exceptional high industry activity. Both led to compromises to optimal production plans. The pandemic forced production to work in ways they have never worked before, with no physical meetings, much of the supervision was virtual, e.g., through videos, photos, and other digitalized data. Many safety measures such as toolbox talks, group daily briefings, and executive site visits were minimal or completely ceased. Although the impact of the pandemic cannot be directly concluded from data collected, it can be assumed that it contributed to weaker safety performance.

2021 was a record year in residential construction in Finland. Over 47 000 residential dwellings started when compared to long term average of 33 000 dwellings per year. The whole construction industry grew nearly 10% during 2021 compared to the previous year (Rakennusteollisuus, 2023a). The supply chains were constrained, and construction sites had challenges to find construction crews. Historic data shows positive correlation with market peaks and weaken safety performance. However, in 2022 the lost time accident rate came down from 2021 even though the industry continued to grow by 10% (Rakennusteollisuus, 2023b). These major changes in construction volume may have contributed to lower safety performance than in the baseline measurement.

CONSTRUCTION INDUSTRY STILL SCORES HIGH ON CUSTOMER SATISFACTION

In the preceding study, Elfving & Seppänen (2022) studied various cross-industry benchmarks and found out that construction industry scores relatively high compared to other industries in customer satisfaction. In Finland, one of the most common cross-industry customer satisfaction measurement is EPSI rating. EPSI rating is developed by Swedish EPSI Rating Group and Svenskt Kvalitetsindex in the 90s. This survey compares new residential construction to 11 other business-to-consumer industries, following how construction industry progresses against the selected other industries (EPSI, 2024). In the 2023 survey, the new residential construction scored second highest customer satisfaction score among 12 business-to-consumer industries. Before that residential construction industry scored highest customer satisfaction score three years in a row. In fact, customer satisfaction was the only cross-industry benchmark the authors identified where construction industry scores above average compared to other industries (Elfving & Seppänen, 2022).

Even if customer satisfaction is not included in Building 2030 consortium measurement, it is valuable to follow up as companies exist for customers. The authors encourage more research to be conducted on construction customer satisfaction, and asking why is the construction industry performing so well in this regard? As posed in the preceding study (Elfving & Seppänen, 2022, same questions for future exploration still stand: “Are we more customer focused than we tend to believe? Does the nature of our industry enable us to understand customer needs better than in many other industries? Or are the expectations so low for our customers that it is easy to meet and exceed them?”

IS THE FINNISH CONSTRUCTION INDUSTRY IMPROVING PERFORMANCE?

Looking at purely the metrics from 2020 and comparing them to 2023, the Finnish construction industry has improved some of the reliability metrics and all the sustainability metrics. A year earlier, 2022, the industry had improved an all the reliability metrics. There is more variation between the segments, residential, offices and schools, where particularly offices are trending negatively on all the reliability metrics. It is still too early to say if the industry is improving or was 2022 or 2023 an exception. A longer time interval and broader data with stable classifications and member companies is needed to claim that the industry is improving performance. Nevertheless, the results give some hope. After decades of stagnation, the Finnish construction industry might finally be improving performance!

CONCLUSIONS

Lean methods were introduced to the Finnish construction industry two decades ago, but due to lack of performance metrics it has not been possible to follow if the industry has improved. The building 2030 consortium has now collected four years of performance metrics. The purpose of the first year was more or less to establish a baseline or starting point for the measurement. In the second, third and fourth measurements the number of projects involved have increased remarkably, increasing the data robustness. Noteworthy, the measurement process itself has been (and will continue to be) a journey of continuous improvement towards acquiring more robust industry benchmarking practices but also providing improvement opportunities for companies. For example, the measurement revealed reliability issues in how companies report recycling rates, raising awareness regarding issues on sustainability measurements of the industry at large.

Most of the performance metrics have improved from the first measurement. The authors believe that at least part of the improvement is genuine improvement. The cause of the improvement is not so much about "radical initiative" rather transparency. No radical initiative was introduced to the industry between the first and last measurements points, instead the data and results have been made transparent and public. What gets measured gets done!

The data has provoked interesting questions and actions. Why are there significant differences in performance metrics between segments? For example, schools and day-care projects perform significantly worse when it comes to "Finish on Budget" and "Zero Accidents than the two other commercial segments. This has sparked further research into schools and day-care projects by the consortium. Another finding that has led to further actions, is the weak understanding about sustainable metrics. In future data requests, it will be further emphasized how recycling rate is defined. Our results regarding schedule performance contradict heavily with the often-heard statement of projects mostly unable to finish on schedule: our data indicate that approximately nine out of ten projects finish on time. Thus, the authors would encourage researchers and practitioners to collect and share data from other markets on schedule performance to assess whenever (i) the Finnish market is performing exceptionally well regarding schedule performance, or (ii) the often-heard statements on poor schedule performance are exaggerated, causing bias on how we perceive production performance overall.

However, it is still too early to definitively say whether the construction industry is improving performance. It looks like the industry is on the right track, but even longer time horizon is required to identify a trend. Also, more longitudinal data and research is required to better understand what causes the changes, e.g., (i) impact of dataset, (ii) genuine improvement, and (iii) external factors such as market fluctuations. Probably ten years of data is required.

The Building 2030 consortium intends to continue to collect annually the performance metrics. The authors believe that in future there will be little difference in performance between single years, therefore they are planning continue reporting the results in IGLCs every two or three years.

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