

Библиографический список

1. Федеральный закон "О техническом регулировании" от 27.12.2002 № 184-ФЗ // Собрание законодательства Российской Федерации. - 2002 г. - № 52. - Ст. 5138
2. Федеральный закон "Технический регламент о безопасности зданий и сооружений" от 30.12.2009 № 384-ФЗ // Собрание законодательства Российской Федерации. - 2010 г. - № 1. - Ст. 5
3. Барина Л.С. : Техническое регулирование в строительстве – итоги, проблемы, перспективы // Строительство. - 2015. - №7-8. - С. 56-62. URL : <http://ancb.ru/publication/read/1477>
4. А. В. Спиридонов, Л. М. Шахнес, А. Г.Чесноков : Проблемы и перспективы технического регулирования в строительстве // Журнал Стройпрофиль 8-05 дата: 28.11.2005, Рубрика: стройплощадка. URL : <http://stroyprofile.com/archive/1986>
5. Абсиметов, В. Э. К вопросу реформирования системы технического регулирования строительной отрасли / В. Э. Абсиметов, К. М. Тусупбеков, М. В. Абсиметов // Наука и инновации в строительстве: (к 45-летию кафедры строительства и городского хозяйства) : сборник докладов международной научно-практической конференции : в 2 т., Белгород, 21 апреля 2017 года / Белгородский государственный технологический университет им. В.Г. Шухова. – Белгород: Белгородский государственный технологический университет им. В.Г. Шухова, 2017. – С. 258-264.

KEY ECONOMIC TRENDS IN THE CONSTRUCTION INDUSTRY IN 2022

Rakhmatullin S.S., student,
Averyanova J.A., Ph.D. in Technical Sciences, Assoc. Prof.
*Kazan State Power Engineering
University, Kazan, Russia*

In 2021, the civil engineering industry was on the road to recovery from the 2020 recession, but it also faced many obstacles that are expected to persist into 2022. Today, the effects of the pandemic continue to be felt both in the economy as a whole and in the field identified in this paper. As of this writing, the world is recovering from the crisis, and the construction industry has an important role to play in supporting nations' economic growth plans. It is predicted that many of the legislative instruments that provide for investment in public and private infrastructure will have a favorable impact on construction firms, and are likely to accelerate the

development of the non-residential construction sector. The residential sector is also expected to continue its strong economic performance, as in 2021.

Generally speaking, according to experts, 2022 will be very productive for the global engineering and construction sector, so it is important to consider key, according to researchers, economic trends in this problem field, which is important to follow this year, an attempt which is undertaken in this paper.

1. The growth of the industry, despite the problems and challenges

Although the construction industry has been adversely affected by the pandemic, it has shown a rapid recovery from the waning first waves of coronavirus infection. Total construction spending reached a post-pandemic peak in July 2021 at more than \$1.5 trillion, nearly 12% higher than the corresponding 2019 average.

In a recent survey, 90% of engineering and construction respondents in the U.S. described the business outlook for their industry as positive, up 25% from similar statements last year. The reason for these high numbers is the growth of the residential and non-residential construction sectors, largely due to the State Infrastructure Investment Act, which has brought nearly \$1 trillion into the nation's construction industry.

Taking a closer look at these two segments, economic activity in the residential construction sector was quite robust in 2021 despite rising material prices and still high rates of coronavirus. However, as for the non-residential sector, the latter did not make significant economic gains for most of last year due to significant spending on educational, office, transportation, medical, and commercial facilities [1-3].

2. Supply chain disruption and supplier selection issues

As we know, in the second half of 2020, the pandemic revealed vulnerabilities in global supply chains in sectors of most economies. Supply problems were expected to stabilize in 2021 as global production resumed and the logistics industry normalized, but shortages in the designated area still persist today, particularly for key construction materials such as aluminum, steel, cement, paint and lumber.

According to a survey conducted by the General Contractors Association of America, 75% of firms in the construction industry reported delays in their projects due to increased lead times and shortages of necessary building materials. In addition, 55% reported delivery delays, indicating that in today's construction industry, firms are still having difficulty predicting when exactly the materials they order can be delivered to their desired destinations.

Another factor is the dramatic increase in costs: during the first seven months of 2021, prices for critical building materials rose several orders of magnitude in some destinations.

Overall, supply chain disruptions and instability are expected to be among the biggest challenges in 2022, and experts say that those companies that can cope with them will significantly improve internal economic performance [1, 2, 4-6].

3. Connected Construction

The construction sector is changing rapidly as engineering companies, contractors, and participants throughout the value chain realize the benefits of connected construction technologies and are increasingly adopting them. These technologies help connect assets, people, processes and job sites on a single platform, allowing the industry to operate more efficiently, reduce production time, optimize asset utilization, and gain greater visibility into operations.

At the heart of connected construction are evolving strategies and solutions, analytics, and extensions that open up new possibilities. Researchers predict that in 2022, connected construction will be a generic term for large digital investments aimed at integrating and automating operations, as well as creating a secure smart infrastructure for the entire value chain [2, 7].

4. Mergers and acquisitions to create opportunities

In 2020, most construction companies were focused on containing risk and saving cash to maintain liquidity. However, in this context, 2021 stands in stark contrast to the previous year: the level of deals in the first nine months was more than 150% higher than the entire 2020 and 10% higher than the same results in 2019.

In the U.S., for example, the construction M&A industry picked up significantly in the first eight months of 2021, allowing market participants to register one-time deals worth more than \$15 billion. At this rate of economic growth, the construction industry is projected to exceed the \$20 billion mark (in terms of the value of related deals) in 2022.

Companies in the construction sector are also showing increased interest in technology and telecommunications facilities to access new digital opportunities and solutions. Between August 2020 and August 2021, U.S. construction companies acquired 25 facilities in software, electronics, technology consulting and services, and film production. This process is expected to gain momentum in 2022 and engineering and construction firms will accelerate technology acquisition activities to create a connected, integrated, and automated operating base [8, 9].

5. Labor shortages

In the aftermath of the pandemic, the biggest question for most engineering and manufacturing companies was how to safely and competently resume work on construction sites. While the industry has been quick to implement the necessary safety standards, it is still struggling to solve the problem of attracting workers. Job shortages can negatively

impact maintenance companies in more ways than one, including project delays and cancellations, shorter task deadlines, inability to respond to market demands, loss of bids, and inability to innovate.

Another factor contributing to the labor shortage is the lack of qualified personnel. This skills shortage is driven in part by the construction industry's evolution toward integrating digital technology into core work processes to further improve productivity, efficiency and safety. It is expected that during 2022, the adaptation of existing and the formation of new workforce experience management strategies could be a critical factor in overcoming workforce challenges [10-12].

References

1. Value of Construction Put in Place. - Text : electronic // BTS Government : [site]. - URL: <https://www.bts.gov/content/value-construction-put-place> (date of application: 10.02.2022).
2. 2021 engineering and construction industry outlook. - Text : electronic // Deloitte : [site]. - URL: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-2021-engineering-construction-industry-outlook.pdf> (date of application: 10.02.2022).
3. Contractor Confidence Falls as ABC Construction Backlog Indicator Stays Flat in July. - Text : electronic // BTS Government : [site]. - URL: <https://www.bts.gov/content/value-construction-put-place> (date of application: 11.02.2022).
4. Private Residential Spending Increased in July. - Text : electronic // Eyeonhousing : [site]. - URL: <https://eyeonhousing.org/2021/09/private-residential-spending-increased-in-july/> (date of application: 11.02.2022).
5. The End Of The Housing Boom Will Be When Mortgage Rates Rise In 2022. - Text : electronic // Forbes : [site]. - 2021. - URL: <https://www.forbes.com/sites/billconerly/2021/07/27/the-end-of-the-housing-boom-will-be-when-mortgage-rates-rise-in-2022/> (date of application: 11.02.2022).
6. Here's what's in the bipartisan infrastructure package. - Text : electronic // CNN : [site]. - 2021. - URL: <https://edition.cnn.com/2021/07/28/politics/infrastructure-bill-explained/index.html> (date of application: 11.02.2022).
7. The future of the construction industry. - Text : electronic // Deloitte : [site]. - 2021. - URL: <https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/future-of-construction-industry.html> (date of application: 11.02.2022).
8. The cost of convergence: \$1.46 trillion and counting. - Text : electronic // Deloitte : [site]. - 2021. - URL:

<https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/technology-media-telecommunications-convergence.html> (date of application: 14.02.2022).

9. Construction Is (Finally) Embracing Tech—And Venture Capital Is Cashing In. - Text : electronic // Bluebeam : [site]. - 2021. - URL: <https://blog.bluebeam.com/venture-capital-invests-in-construction-technology/> (date of application: 12.02.2022).

10. Bureau of Labor Statistics. - Text : electronic // USA Government : [site]. - 2021. - URL: <https://www.usa.gov/federal-agencies/bureau-of-labor-statistics> (date of application: 12.02.2022).

11. Job Openings and Labor Turnover – July 2021. - Text : electronic // Forexfactory : [site]. - 2021. - URL: <https://www.forexfactory.com/news/1106019-job-openings-and-labor-turnover-july-2021> (date of application: 18.02.2022).

12. Unleash workforce potential. - Text : electronic // Deloitte : [site]. - 2021. - URL: <https://www2.deloitte.com/global/en/pages/human-capital/articles/unleash-the-workforce.html> (date of application: 19.02.2022).

КАК ГОТОВИТЬ ГРАМОТНЫХ УПРАВЛЕНЦЕВ СО СТУДЕНЧЕСКОЙ СКАМЬИ, ПРИМЕНЯЯ ISO 9001

**Соловьев В. И., д-р техн. наук, проф.,
академик НИА РК, Генеральный директор
ТОО «EUROASIA MS»,
г. Алма-Ата, Казахстан**

«Единственное, что мешает мне учиться – полученное мной образование» Альберт Эйнштейн

Известно, что в конце XIX века развитие рыночных отношений инициировало у участников рынка необходимость улучшения качества взаимодействий между ними путем создания стандартных деловых условий (правил), обеспечивающих быструю информированность и осведомленность с целью ускоренного принятия соответствующих решений в сфере торговли товарами и услугами.

Началом решения этой проблемы можно считать создание в 1946 г. Международной организации по стандартизации – ISO (штаб-квартира город Женева). В состав ISO входят партнеры порядка из 160 стран. Целью создания этой организации являлось достижение мировым сообществом консенсуса для упрощения международного обмена товарами, услугами и кооперацией в научной, технологической и экономических сферах, в том числе подготовки кадров, способных работать в условиях современного рынка труда.