

METHODOLOGY

**ON THE REVISION OF THE SLOVAK
RECOVERY AND RESILIENCE PLAN**

**[RECOVERY
AND RESILIENCE]
PLAN**



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Rationale for the revision of construction costs and benchmarks

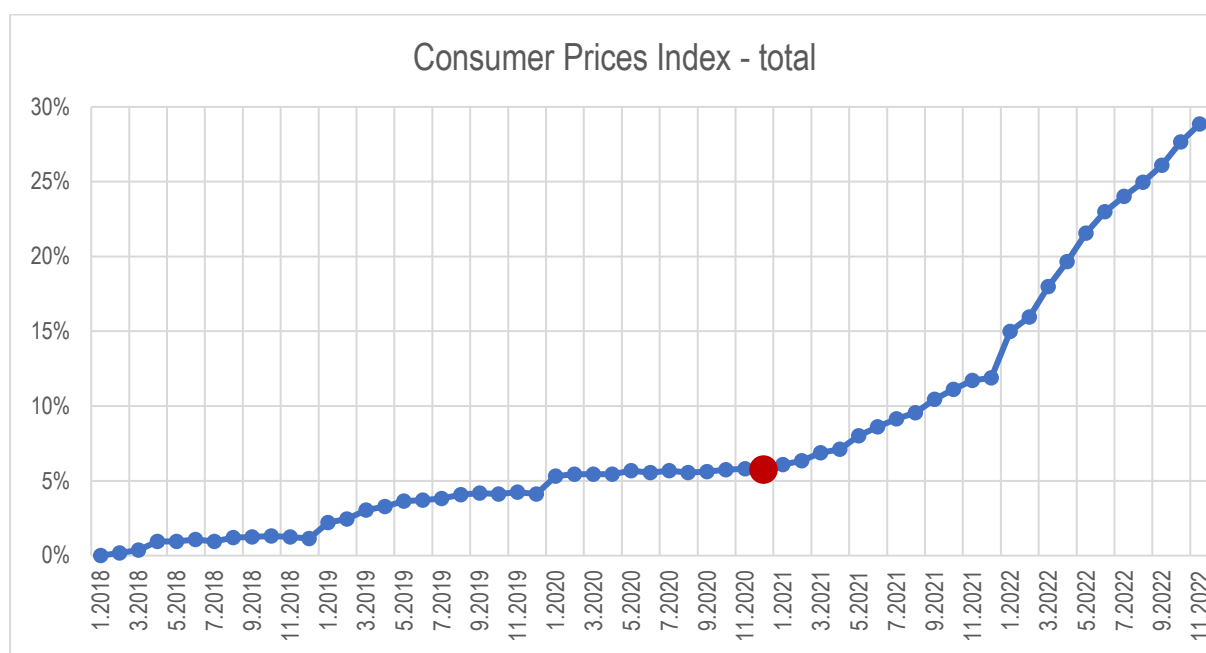
Increasing overall inflationary pressures multiplied by the unprecedented Russian invasion of Ukraine, an immediate neighboring country, are already seriously affecting and in the future will have a very significant impact on planned infrastructure projects in Slovakia.

Three key elements have been influencing the processes to re-assess the financial allocation and ability to finance the construction investments at the beginning of 2022:

1. Continuous rise in overall price levels with an accelerated pace (see the graph of CPI index until March 2022 below);

The decision to focus on construction investments that would boost the economy for the next years was originally made under the conservative assumption of 2% annual inflation. However, the latest developments in the construction sector do not allow to calculate expected investments under this conservative assumption and the Recovery and Resilience Plan of the Slovak Republic (SK RRP) revision should be performed using empirical data from the statistical databases that would allow for feasible financial management.

Graph 1 Consumer Price Index - Slovakia



Source: DataCube, Statistical Office of Slovak republic, 2022¹

2. Contractors suspending construction work and/or withdrawing from contracts for construction investments due to increasing prices of construction materials (case of municipalities and public investors);

As early as the beginning of the second quarter of 2022, indications from municipalities for investments financed primarily by the European Structural and Investment Funds (ESIF) have signaled that contractors were starting to demand price increases or outright stopping work on projects, i.e. withdrawing from contracts.

¹ available at: http://datacube.statistics.sk/#/view/sk/VBD_INTERN/sp0006ms/v_sp0006ms_00_00_00_sk

For this reason, at the end of July 2022 the National Implementation and Coordination authority (NIKA) launched a survey among beneficiaries of ESIF funds to investigate the risks of the project implementation related to such price increases. We asked municipal representatives *to what extent have the rising prices of construction materials and works played a role in limiting construction investments and projects*. Although structured data is not available at this point in time, more than 90% of respondents indicated that the rising prices of construction materials have *directly and negatively affected the implemented construction projects*. These were mainly construction projects of kindergartens and primary schools, homes for the elderly, cycling infrastructure, sport grounds, reconstruction of historical and specialized buildings, as well as technical and ground infrastructure (reconstruction of roads and pavements). In 35.7% of cases, they triggered the need to sign an amendment to the implementation contract with the contractor. In 21.4% of the cases, they led to the suspension of works on already implemented construction works. In 7.1% of cases, they led to the contractor's withdrawal from the contract. In the case of already launched tenders, as many as 17.9% of the cases resulted in unsuccessful tendering and 10.7% of the cases resulted in the refusal of the winner to sign the contract after the tendering procedure had been completed.

In the case of a request for an increase in the price of the work (contract amendment), the requested increases ranged between 15% and 36% of the cases. The most frequently cited reason for the price increase was the cost of construction materials and, to a lesser extent, an increase in the cost of human labour.

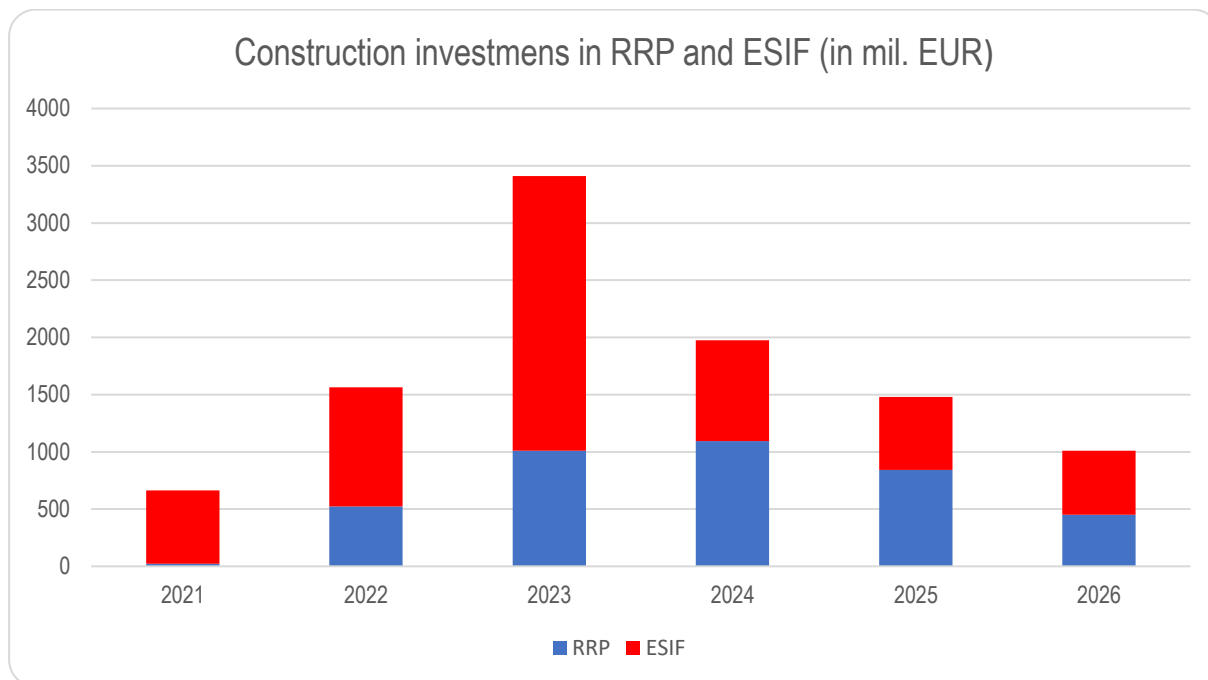
Above indications from the failed public procurement process serve as an initial evidence of the existence of risks of not delivering the planned outcomes of constructions due to construction material price increase on time and within the set budgets.

3. Limited capacities in the construction sector.

SK RRP foresees construction investments of more than EUR 4 billion. In addition, up to EUR 3 billion per year will be invested from ESIF. While such an increase in investment is not entirely unprecedented, it still represents a huge challenge. Compared to the similar rise in the construction activities between 2000 and 2008, the sector was able to use the available labour, as the unemployment rate in Slovakia was at the level of 18.8% in 2000. However, the unemployment rate in 2021 already stood at 6.8%. In addition, we currently need to expand the construction capacities especially for technology-intensive and skill-intensive activities, e.g. high technology insulation technology, installation of equipment such as heat pumps, solar panels, and batteries, or renovation of historic and specialized buildings.

Construction capacities in Slovakia respond, in the medium term, relatively flexibly to the increasing (or decreasing) demand. In the short term, however, it is especially difficult to increase this capacity. Covering additional demand created by the SK RRP and the new ESIF programming period, the construction investments will be challenging and will require active private and public sector cooperation with a clear definition of long-term public planning under the new economic environment where the 2% annual inflation would not stand.

Graph 2 Construction Investments in RRP and ESIF



Source: Estimation of construction investments (in mil. EUR) from RRP and ESIF, 2022

Improving the Slovak capacity to absorb/implement a large public investment will also require some level of private investment, both in capital and skilled labor. Relative to other sectors, the construction sector will be forced to offer comparatively more attractive (higher) wages. It will also need to have the prospect of leveraging its investments in the “normal” medium term. In other words, the construction firms should have the prospect of higher demand not just for three to five years, which is the horizon of SK RRP, but instead, for an upcoming decade.

The above elements were carefully assessed not only at the level of NIKA but generally in the Slovak public administration. Main outcomes of this assessment as it relates to the SK RRP is presented in this methodology together with the underlying evidence on how the rising construction costs were scrutinized and what risk mitigation actions are being proposed.

Revision of the RRP – methodology

Based on the *Commission Notice on the Guidance on Recovery and Resilience Plans in the context of REPowerEU*

“If a major increase in the costs for a particular measure leads to a situation where the related milestone or target can no longer be achieved, the Member State may request the modification of the related milestone or target. The request should be based on a thorough justification. Member States would need to provide evidence of the direct impact on the measure(s) they seek to revise. These increases could also not justify an amendment of investments that are not directly concerned by prices of raw materials (e.g. purchase of medical equipment or research grants for studies on social housing) or important supply chain constraints. These price increases cannot constitute objective circumstances for revising reforms as reforms are not generally cost dependent. In addition, no request for amendments should undermine the overall implementation of the recovery and resilience plans.”

[Commission Notice on the Guidance on Recovery and Resilience Plans in the context of REPowerEU](#)

(pg. 17-18)

The methodology for the assessment and estimation of construction cost increases is developed for the purpose of updating the SK RRP in order to revise the expected allocations for investments where construction costs are foreseen based on the empirically proven cost increases.

1 Methodology and data

The methodology for estimating construction cost increases is based on two consecutive steps: Step 1 updates the original cost benchmarks to current price levels and Step 2 provides projections of expected cost increases between 2022 and 2026.

Step 1: Updating the original cost estimates to current price levels with the tasks below being performed in the following order:

- a. obtaining detailed budget data on the costings for key investments in the education components (kindergartens, primary schools) dated to the time of original costing (years 2015 – 2020);
- b. applying an independent pricing software to the detailed budgets available for the planned investments (using the Cenkos construction pricing software and involving a construction specialist to re-cost the projects available at detailed level of cost structure) to re-cost the projects as of March 2022 (Cenkos construction price database as of Q4/2021);
- c. obtaining the data on primary school projects originally used for benchmarks calculations in 2020 and comparing to the actual final public procurement price of the project in order to estimate the cost increase during 2021;
- d. analyzing planned investments and determining the share of construction activities in the total allocation to determine the impact of construction cost increase on the total allocation of the investment;
- e. obtaining independent statistical data on the evolution of prices of construction materials, construction works and other inputs to construction activities;
- f. comparing the statistical data on the construction output prices increase with the re-costed projects and final price tags of investments from the public procurement procedures;
- g. validating the unified approach towards assessing the construction price increase across the public sector construction investments with external body (ÚHP – Value-for-Money Department at the Ministry of Finance - MoF) and finalizing the final construction price index using the unified methodology envisaged by the Ministry of Transport and Construction's (MTC) Methodological Guideline for Risk Mitigation in Construction Investments (effective from June 2022).

Step 2: Projections of expected cost increases between 2022 and 2026; using the projection data from the latest MoF prognosis on the macroeconomic environment, including processing of data on the projection of inflation development for individual price items from the official estimate of the MoF on the basis of the other conclusions of the Macroeconomic Forecasting Committee of 30 June 2022; and its application onto construction investments planned in the SK RRP.

1.1 Step 1: Updating the original cost estimates to the current price level

Following the approach described above we have identified 2 components where concrete projects are available and were (partially) implemented. Based on the data from these 2 components, we have used cost structures and statistical data to extrapolate the cost increase to other components of the SK RRP.

1.1.1 Kindergartens – Component 6

In order to get a realistic picture on the construction cost increases for 2021 and partly 2022, we used the same projects for the education component (component 6), when available, and asked an external expert to recalculate the cost of the construction parts of the projects for kindergartens.

- a) The first step was to select the projects for the re-calculation. Originally, for the SK RRP benchmark calculation in 2021, the database of the projects included 290 projects of kindergartens priced between 2015 and 2020. From these projects, we have selected 9, whose price-per-kindergarten place was close to the median price of all projects and where the detailed item structure of the technical part of the project was available.
- b) Secondly, in March 2022, we have employed a construction professional (Slovak University of Technology, Bratislava) with the task to re-cost the construction price of these 9 selected kindergarten projects to the price at the end of 2021. The price list database was dated December 2021 and the re-costing was done in March 2022. The objective was to assess the construction cost increases by an independent professional using the comprehensive database of construction materials, labor, and technology by the company Kros. The overview of the *Construction Materials and Works Database* for most recent prices is available after purchase of the CenKros construction software².

The list of reviewed kindergarten projects including the time and cost estimate at the original time and at the time of re-costing (December 2021 vs the re-costing performed in March 2022) is presented in the table below.

² available at: https://www.kros.sk/cennikova-databaza/?gclid=Cj0KCCQjw_vjWBhD8ARIsAH1mCd6N9or_IHfr3dh76zVqsUM7R4woHuVpj40igRvvh1xIVFrpHzfkHkaAiQOEALw_wcB

Table 1 Original costing and re-costing of kindergarten projects (original data)

Name of project	Date of original costing (MM.YY)	Total costs at original date (without VAT)	Date of re-costing (MM.YY)	Total costs at date of re-costing (without VAT)	Price increase	File (original costing)	File (re-costing)
Kindergarten Špačince	12.16	235 834,87 €	3.22	347 419,36 €	47,31%	Original	Recosting
Kindergarten Ivanka pri Dunaji	12.16	185 393,15 €	3.22	259 819,68 €	40,15%	Original	Recosting
Kindergarten Púchov - new building	12.17	375 260,11 €	3.22	452 659,39 €	20,63%	Original	Recosting
Kindergarten Michalová - reconstruction	12.17	119 779,17 €	3.22	174 709,46 €	45,86%	Original	Recosting
Kindergarten Dechtice - reconstruction	12.15	216 508,70 €	3.22	241 119,75 €	11,37%	Original	Recosting
Kindergarten Sirk - increased capacity	12.17	154 611,77 €	3.22	216 422,50 €	39,98%	Original	Recosting
Kindergarten Sabinov - increased capacity	12.17	259 849,36 €	3.22	326 198,53 €	25,53%	Original	Recosting
Kindergarten Haniska - increased capacity	12.16	289 579,17 €	3.22	325 172,84 €	12,29%	Original	Recosting
Kindergarten Motýlik, Nový Cabaj - new building	12.20	346 446,12 €	3.22	389 676,87 €	12,48%	Original	Recosting

Source: SK RRP costing (original price data, 2020), Cenkos (re-costing, 2022)

It should be noted that the price increase of 28.4% (on average) could be also dependent on the date of the original costing as the projects were originally priced in different points in time (between years 2015 and 2020). For the purposes of methodological objectivity, the price increases from the original costing of the above presented budgets should be discounted to the specific time point (December 2020) in order to obtain comparable overview on the specific price increase in construction costs.

In order to discount the price increases to the same time point (December 2020), we have used two different price indices:

1. HICP *
2. Construction Price Index **

Based on these two indices, the average price of the analyzed kindergarten projects has increased between 19.95% and 22.26% between December 2020 and December 2021. More details on the price increases of the analyzed kindergarten projects using both discount indicators (HICP and Construction Price Index) are presented in *Table 2* below.

Table 2 Original costing and re-costing of kindergarten projects (adjusted to December 2020)

Name of project	Date of original costing (MM.RR)	Date of re-costing (MM.RR)	Price increase	Inflation index from date of original costing until 12.2020 using HICP*	Normalized Price Increase (HICP*)	Inflation index from date of original costing until 12.2020 using Construction Price Index**	Normalized Price Increase (Construction Price Index**)
Kindergarten Špačince	12.16	3.22	47,31%	1,09	35,34%	1,09	35,08%
Kindergarten Ivanka pri Dunaji	12.16	3.22	40,15%	1,09	28,76%	1,09	28,52%
Kindergarten Púchov - new building	12.17	3.22	20,63%	1,08	11,94%	1,05	15,12%
Kindergarten Michalová - reconstruction	12.17	3.22	45,86%	1,08	35,35%	1,05	39,19%
Kindergarten Dechtice - reconstruction	12.15	3.22	11,37%	1,09	2,02%	1,08	3,06%
Kindergarten Sirk - increased capacity	12.17	3.22	39,98%	1,08	29,89%	1,05	33,58%
Kindergarten Sabinov - increased capacity	12.17	3.22	25,53%	1,08	16,48%	1,05	19,79%
Kindergarten Haniska - increased capacity	12.16	3.22	12,29%	1,09	3,16%	1,09	2,97%
Kindergarten Motýlik, Nový Cabaj - new building	12.20	3.22	12,48%	1,00	12,28%	1,00	12,89%
Average price increase					19,95%		22,26%

* HICP - Indicator Harmonized indices of consumer prices (average of the year 2015=100) - monthly [sp0017ms] - Harmonized indices of consumer prices in Slovakia published by the Statistical Office of the Slovak Republic on its website www.statistics.sk (online code: sp0017ms)

** Construction Price Index - Indicator Price indices of construction works and materials (2015=100) - quarterly [sp2063qs] - Price indices of construction works and materials (producer prices) for the quarter, published by the Statistical Office of the Slovak Republic on its website www.statistics.sk (online code: sp2063qs). The indicator is calculated for 2015 and 2016 from the historical data Price indices of construction works and materials (2010=100) - quarterly [sp2026qs] by weighting the ratio of the index [sp2063qs] and the index [sp2026qs] over the 4 quarters of 2017. The average of these ratios was used to recalculate the index retrospectively.

The average price increase for the kindergarten project of 19.95% or 22.26%, respectively, confirms that the benchmarks priced in the SK RRP for construction investments should be re-calculated.

In order to have a unified approach towards construction investments in the SK RRP, re-costed projects should not be used as a proxy for other construction investments. The results of the re-costing exercise serve as a proof of significant price increases. Therefore, for assessing the cost increases and re-valuating the benchmarks for the SK RRP components, where the construction investments are planned, we will use the unified price index created by the Ministry of Transportation and Construction (later only “MTC”). The document and the formula created by the MTC to calculate the inflation clause is explained further in the text.

1.1.2 Primary schools – Component 7

For the primary schools that are part of the Component 7, we were not able to use the Cenkros software, but we still aimed at the high level of detail. We asked the regional self-governing body (BSK – Bratislava self-governing region) to provide us with an update on the projects that were originally used for the benchmarks for SK RRP in 2020 and have been tendered by public procurement process at the end of 2021 and early 2022.

We have compared two price tags for the projects that have passed the public procurement process, more specifically, we compared final price as a result of the public procurement process and the price set before the tender (Estimated contract value – ECV). From the available data, we were able to compare the final price tag for 18 projects out of the 26 available projects.

The results of the construction cost increase analysis are presented in the table below. The price increase represents the ratio calculated as a share of the public procurement final price (column named “*Total costs as a result of public procurement (Costs after PP)*” in the table below) and the Estimated contract value (column named “*Estimated contract value (ECV)*” in the table below) minus 1.

Table 3 Primary school projects - re-costing data

Name of project	Applicant	number of new master classes	Initial cost estimate (2020/2021)	the amount of expenditure in the NFA application	cost per 1 class	of which construction work					Factual price increase (Costs after PP / ECV)
						expenditure in the NFA application	Estimated contract value (ECV)	Total costs as a result of public procurement (Costs after PP)	Number of classes	cost per 1 class	
Construction of pavilion and a gym – primary school Limbach	Limbach	8	1 700 000,00 €	2 017 332,83 €	252 166,60 €	1 985 534,58 €	1 796 338,58 €	1 961 972,00 €	8	245 246,50 €	9%
Expansion of classroom capacities – primary school K. Brúderovej	Bratislava - Vajnory	6	2 000 000,00 €	2 945 412,93 €	490 902,16 €	2 945 412,93 €	2 507 117,11 €	2 495 236,34 €	6	415 872,72 €	0%
Completion of primary school I. Bukovčana 3	Bratislava - Devínska Nová Ves	8	1 950 000,00 €	2 398 078,20 €	299 759,78 €	2 381 465,40 €	2 221 844,45 €	2 530 263,04 €	8	316 282,88 €	14%
Expansion of classroom capacities – primary school Dubová	Bratislava - Staré Mesto	6	2 800 000,00 €	2 699 851,11 €	449 975,19 €	2 691 892,35 €	2 600 000,00 €				
Reconstruction and expansion of primary school Šenkvice	Šenkvice	7	1 973 000,00 €	2 132 482,23 €	304 640,32 €	1 858 964,55 €	1 549 443,35 €	1 821 283,00 €	7	260 183,29 €	18%
Reconstruction of primary school Kalinkovo	Kalinkovo	6	1 640 000,00 €	1 766 640,46 €	294 440,08 €	1 766 140,46 €	1 376 905,70 €	1 541 993,00 €	6	256 998,83 €	12%
Expansion of classroom capacities – construction of a gym – extension of a cafeteria – primary school Medzilaborecká	Bratislava-Ružinov	9	2 500 000,00 €	2 850 544,49 €	316 727,17 €	2 850 544,49 €	2 676 666,62 €	2 850 544,49 €	9	316 727,17 €	6%
Construction of a new detached pavilion – primary school Slovenský Grob	Slovenský Grob	6	3 000 000,00 €	3 000 000,00 €	500 000,00 €	3 000 000,00 €	2 541 999,77 €	3 331 082,00 €	6	555 180,33 €	31%

Expansion of classroom capacities – primary school Tomášov	Tomášov	6	2 000 000,00 €	2 414 022,26 €	402 337,04 €	2 257 214,67 €	1 843 763,90 €	2 205 091,00 €	6	367 515,17 €	20%
Expansion of classroom capacities – primary school Malokarpatské námestie 1, Bratislava	Bratislava - Lamač	7	3 000 000,00 €	2 999 999,15 €	428 571,31 €	2 999 999,15 €	3 646 556,95 €	3 721 678,45 €	7	531 668,35 €	2%
Extension of primary school and construction of a gym – primary school Kráľová pri Senci	Kráľová pri Senci	7	1 800 000,00 €	2 311 617,93 €	330 231,13 €	2 311 117,93 €	1 921 534,94 €	2 283 850,00 €	7	326 264,29 €	19%
Expansion of classroom capacities – primary school Častá	Častá	6	2 289 000,00 €	2 582 781,36 €	430 463,56 €	2 482 388,67 €	2 051 646,12 €	2 220 779,00 €	6	370 129,83 €	8%
Expansion of classroom capacities and construction of a cafeteria	Bratislava - Záhorská Bystrica	8	2 000 000,00 €	2 102 278,22 €	262 784,78 €	1 930 803,36 €	1 790 900,87 €	1 930 803,36 €	8	241 350,42 €	8%
Expansion of classroom capacities – primary schools in Bratislava-Rača	Bratislava - Rača	25	6 000 000,00 €	6 000 000,00 €	240 000,00 €	2 999 993,77 €	6 067 818,34 €	5 958 260,44 €	25	238 330,42 €	-2%
Reconstruction and completion of cafeteria construction – primary school Rusovce - repurposing	Bratislava - Rusovce	6	2 050 000,00 €	2 590 388,72 €	431 731,45 €	2 427 137,88 €	2 044 992,51 €	2 038 668,55 €	6	339 778,09 €	0%
Extension of 12 classrooms – primary school Rohožník	Rohožník	6	1 500 000,00 €	2 999 528,55 €	499 921,43 €	2 970 878,55 €	2 694 015,00 €	3 942 303,59 €	6	657 050,60 €	46%
Expansion of classroom capacities – primary school Ostredková – new classroom pavilion and a gym	Bratislava-Ružinov	9	3 000 000,00 €	3 000 000,00 €	333 333,33 €	2 885 442,37 €					
Modular extension primary school Na bielenisku, Pezinok	Pezinok	6	400 000,00 €	437 702,41 €	72 950,40 €	437 702,41 €	392 000,00 €	437 702,00 €	6	72 950,33 €	12%
Expansion of classroom capacities – primary school Javorová alej, Chorvátsky Grob	Chorvátsky Grob	8	3 000 000,00 €	3 000 000,00 €	375 000,00 €	3 000 000,00 €	3 477 124,73 €	4 171 349,00 €	8	521 418,63 €	20%

Expansion and modernization of primary school Lozorno	Lozorno	8	2 500 000,00 €	2 999 998,97 €	374 999,87 €	2 823 286,37 €	3 142 516,49 €	3 610 378,00 €	8	451 297,25 €	15%
Expansion of classroom capacities – primary school kpt. Jána Nálepku Stupava	Stupava	10	3 000 000,00 €	2 959 356,28 €	295 935,63 €	2 826 805,00 €		2 827 765,00 €	10	282 776,50 €	
Expansion of classroom capacities – primary school Cádrová	Bratislava-Nové Mesto	6	2 000 000,00 €	2 475 805,14 €	412 634,19 €	2 032 666,38 €					
Expansion of classroom capacities – primary school Odborárska č.2	Bratislava-Nové Mesto	6	1 250 000,00 €	1 330 266,76 €	221 711,13 €	1 312 903,43 €					
Redevelopment of an original cafeteria into a primary school - repurposing	Dunajská Lužná	16	3 000 000,00 €	3 000 000,00 €	187 500,00 €	3 000 000,00 €		3 892 656,00 €	16	243 291,00 €	
Extension of primary school Nová Dedinka	Nová Dedinka	8	2 500 000,00 €	2 964 158,60 €	370 519,83 €	2 801 908,29 €		2 720 000,00 €	8	340 000,00 €	
Completion of primary school in Bernolákovo	Bernolákovo	10	3 000 000,00 €	3 000 000,00 €	300 000,00 €	3 000 000,00 €					
TOTAL		214	61 852 000,00 €	68 978 246,60 €	322 328,26 €	63 980 202,99 €		58 493 658,26 €	177	330 472,65 €	13%

Source: BSK (Bratislava self-governing region), 2022

The average price increase of 13% for the primary school projects confirms the construction price increase. On the other hand, using the ECV approach did not show a dramatic increase compared to the approach used for the kindergarten projects.

When comparing the price increase for the construction investments foreseen in the components 6 and 7 with the Eurostat construction index (Output price index in construction³), the price increase is very comparable, 13% vs. 11.85%.

Similar to the statement on kindergarten projects, we should use a unified approach towards construction investments in the SK RRP and therefore avoid using the number obtained from the re-valuation of primary school as a proxy for other construction investments and their benchmarks.

For assessing the cost increases and re-valuating the benchmarks for the SK RRP components where the construction investments are planned, we use one unified construction price index created by the Ministry of Transportation and Construction (later only "MTC"). The document and the formula created by the MTC to calculate the inflation clause is explained further in the text.

³ https://ec.europa.eu/eurostat/databrowser/product/page/STS_COPI_Q_custom_3145306

1.1.3 Identification of cost structure within the SK RRP investments

Having identified the empirical increase in construction costs on the example of school and kindergarten construction (components 6 and 7), we proceeded to evaluate the SK RRP investments in which construction expenditures are concentrated in terms of the structure of planned expenditures.

We identified what portion of the expenditures in the relevant component and investment of the SK RRP should be allocated to construction projects and what portion should be allocated to potential technical and technological equipment, administrative and design expenditures, and other expenditures. This breakdown according to the original costing of the investments in the SK RRP is intended to specify the part of the investments that will be subject to the identified construction cost increases and what part of the investment will not be affected by the price increase.

The table below presents the SK RRP investments where construction expenditures have been identified. At the same time, the table presents the expenditure structure in terms of construction costs, technology, and other expenditure. This allows for a more efficient examination of the impact of cost increases on other investments of the SK RRP that have not been subject to detailed project re-pricing, and for which it is possible to use general statistical indicators focusing on construction costs or producer prices of construction materials and works.

Table 4 SK RRP investments - indicated division of the allocation according the expenditure type

Component		Investment		Indicated division of the allocation according the expenditure type				Intervention area
No.	Name	Code	Name	Building	Equipment	Admin/project support	Other	
2.	Renovation of buildings	02I01	Improving the energy performance of family houses	100%	0%	0	0	025bis
		02I02	Restoration of public historic and listed buildings	95%	0%	5%	0	026bis
6.	Availability, development and quality of inclusive education at all levels	06R01	Investment in building kindergarten capacity (under reform 1)	85%	10%	0%	5%	026bis
		06I01	Investment 1: De-barrierisation of school buildings at all levels of the education system					-
7.	Education for the 21st century	07I02	Investment 2: Completion of school infrastructure					026bis
8.	Improving the performance of Slovak universities	08I01	Investment 1: Investment support for the strategic development of universities	64%	36%	0	0	026bis
11.	Modern and accessible inpatient and acute care	11I02	New hospital network - construction					025ter
		11I02	New hospital network - reconstruction	64%	25%	6%	5%	026bis
		11I04	Construction of emergency medical service (EMS) stations					-

		11I04	Renovation of emergency medical service (EMS) stations						026bis
12.	Humane, modern and accessible mental health care	12I02	Creation of detention facilities						-
		12I03	Building centres for health and social community mental health care - new buildings						-
		12I03	Building centres for health and social community mental health care - reconstruction						026bis
		12I07	Humanisation of wards in institutional care						026bis
13.	Accessible and quality long-term social and health care	13I01	Expansion of community social care capacities	80%	15%	5%	0%		026bis
		13I02	Expansion and renewal of aftercare and nursing care capacities	80%	15%	5%	0%		026bis
		13I03	Expansion and renewal of palliative care capacities						-
15.	Reform of the judiciary	15I01	Investment in buildings and re-organisation of courts - construction/acquisition of new buildings	93%	0%	2%	5%		-
		15I01	Investments in buildings and re-organisation of courts - reconstruction	90%	0%	2%	8%		026bis
16.	Fight against corruption and money laundering, public safety and security	16I02	Modernisation and building of professional capacities of the police force - reconstruction of buildings	80%	15%	0%	5%		026bis
		16I03	Modernisation of the fire and rescue system - renovation of fire station buildings	95%	0%	0%	5%		026bis

Source: Original costing of SK RRP, 2021

Identification of key cost areas would allow us to determine the impact of construction price increases more precisely for each investment without the need to re-cost each project.

Above presented table contains a portion of the building costs within investments, which offers a basis for the inspection of expected expenses increase in the overall SK RRP and thus provides more information on the financial risks.

In order to estimate the financial risks arising from the cost increases, the following chapter provides more insights into the process of estimating expected construction costs increases in Slovakia during the last 18 months (December 2020 – June 2022) using official statistical data and changes in the forecasted inflation in the construction prices (material, labour, energy).

1.1.4 Statistical data on construction prices

When the initial re-costing was performed and the increased construction prices were empirically confirmed, estimating expected construction cost increases in remaining components/investments where constructions investments are expected.

To evaluate the expected cost increases in construction heavy investments, we have used several indicators to estimate construction price increases during the period of December 2020 and July 2022:

1. Price indices of constructions works and materials – quarterly data [sp2063qs]⁴, where 3 sub-indices are available:
 - a. Price indices of construction work
 - b. Indices of construction materials (producer prices)
 - c. Indices of construction materials (purchase prices)
2. Price indices of construction works by the Classification of types of Construction - quarterly data [sp1806qs]⁵
3. Harmonized indices of consumer prices (Average of year 2015=100) - monthly [sp0017ms]⁶
4. Construction cost (or producer prices), new residential buildings - quarterly data [STS_COPI_Q_custom_3145306]⁷
5. Price indices in the production sphere [sp0102ms] for 3 cost components⁸
 - a. Prices of construction works (labour)
 - b. Prices of materials consumed in construction (construction material production prices)
 - c. Prices of industrial producers - supply of electricity, gas, steam, cold air (energy)

For an in-depth analysis of construction price increase, we have worked in more detail with the sources presented in the above-mentioned points 1 – 5.

When assessing the construction prices using the production sphere indicators (sp0102ms), we have accommodated the recommendation of the MoF (Value-for-Money Department, ÚHP), which have created the construction price index using 3 cost components (labour, construction materials, energy). The source for the price development of these 3 cost components are presented in the point 5 above. According to the data of the Statistical Office of the Slovak Republic on the increase in construction materials, energy and construction works, the price increase in these 3 cost components for the last 18 months (measured as the change in the index between 6/2022 and 12/2020) is at the level of 40.13% for the construction materials, 19.67% for construction works (labour) and 80.36% for energy. A more detailed overview is presented in the graph below.

⁴ available at: http://datacube.statistics.sk/#!/view/en/VBD_SLOVSTAT/sp2063qs/v_sp2063qs_00_00_00_en

⁵ available at: http://datacube.statistics.sk/#!/view/en/vbd_sk_win2/sp1806qs/v_sp1806qs_00_00_00_en

⁶ available at: http://datacube.statistics.sk/#!/view/en/VBD_INTERN/sp0017ms/v_sp0017ms_00_00_00_en

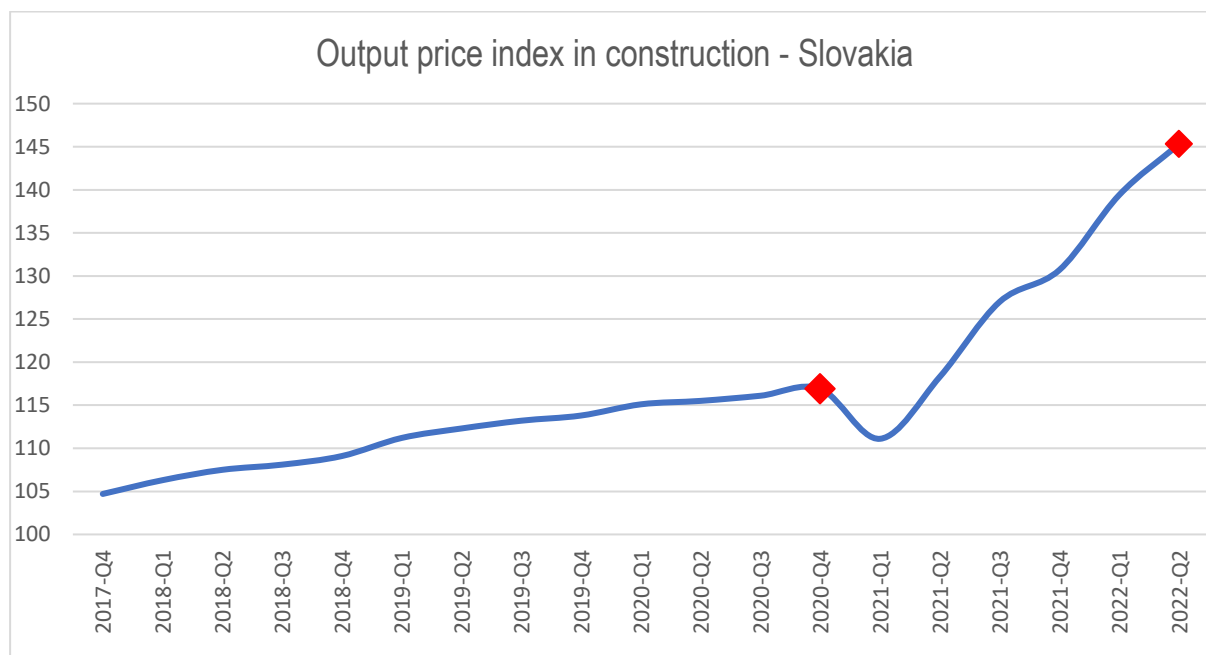
⁷ available at: https://ec.europa.eu/eurostat/databrowser/product/page/STS_COPI_Q_custom_3145306

⁸ available at: [http://statdat.statistics.sk/cognosex/cgi-](http://statdat.statistics.sk/cognosex/cgi-bin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID(%22i3D3E5C51C43F4695B8CE4324B741FCF9%22)&ui.name=ndexy%20cien%20vo%20v%c3%bdobnej%20sf%c3%a9re%20oproti%20b%c3%a1zick%c3%a9mu%20obdobiu%20%5bsp0102ms%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosex%2fcps4%2fportlets%2fcommon%2fclose.html)

[bin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID\(%22i3D3E5C51C43F4695B8CE4324B741FCF9%22\)&ui.name=ndexy%20cien%20vo%20v%c3%bdobnej%20sf%c3%a9re%20oproti%20b%c3%a1zick%c3%a9mu%20obdobiu%20%5bsp0102ms%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosex%2fcps4%2fportlets%2fcommon%2fclose.html](http://statdat.statistics.sk/cognosex/cgi-bin/cognos.cgi?b_action=cognosViewer&ui.action=run&ui.object=storeID(%22i3D3E5C51C43F4695B8CE4324B741FCF9%22)&ui.name=ndexy%20cien%20vo%20v%c3%bdobnej%20sf%c3%a9re%20oproti%20b%c3%a1zick%c3%a9mu%20obdobiu%20%5bsp0102ms%5d&run.outputFormat=&run.prompt=true&cv.header=false&ui.backURL=%2fcognosex%2fcps4%2fportlets%2fcommon%2fclose.html)

The second scenario is based on the Eurostat data on output prices in constructions of new buildings (**Scenario 2**). Considering Eurostat data on output prices in construction of new residential buildings, the construction prices in Slovakia have also increased (see graph below).

Graph 4 Eurostat Output price index in construction - Slovakia



Source: Eurostat, 202210

Using the official Eurostat data on the output prices in construction of new residential buildings in Slovakia, the empirical (observed) increase in output prices during the analyzed period of 18 months (December 2020 – June 2022) accounted for **24.29%**.

These facts give a solid economic incentive to review the costs of planned investments under the RRP in order to get a comprehensive overview of the impact of construction costs increases on planned outputs.

On June 8th 2022, the government issued a nation-wide methodological guideline on the implementation of inflation clause that would unify the approach towards assessing the impact of construction cost increases on one hand, and set the unified calculation of price increase for the future contracts on the other.

The purpose of this inflation clause was to calm the market and relieve pressures on the contractors who started to withdraw from contracts with public investors. The inflation clause was meant as a tool to assure contractors that any future potential price increases do not need to be priced in with full immediate impact on the public investors budgets. Inflation clause should be viewed as a risk management tool where the public investor bears the risk (probability) of future unexpected price increases instead of signing the contract where the price is increased immediately with full certainty.

The formula for inflation clause as defined in the Methodological guideline of the MTC is as follows:

¹⁰ available at: https://ec.europa.eu/eurostat/databrowser/product/page/STS_COPI_Q_custom_3145306

$$P_t = 0,10 + 0,20 * \frac{HICP_t}{HICP_{t_0}} + 0,08 * \frac{D_t}{D_{t_0}} + 0,62 * \frac{CMI_t}{CMI_{t_0}}$$

Given that:

t_0 – moment of signing the contract (quarter)

t – number of quarters after signing the contract

P – price increase indicator at time t (quarters after signing the contract)

HICP – Harmonized Index of Consumer Prices (Indicator Harmonized indices of consumer prices (average of the year 2015=100) - monthly [sp0017ms] - Harmonized indices of consumer prices in Slovakia published by the Statistical Office of the Slovak Republic on its website www.statistics.sk.)

D – price index of diesel fuel (Indicator Average fuel prices in the Slovak Republic (Diesel) - monthly [sp0202ms] calculated per quarter, published by the Statistical Office of the Slovak Republic on its website www.statistics.sk.)

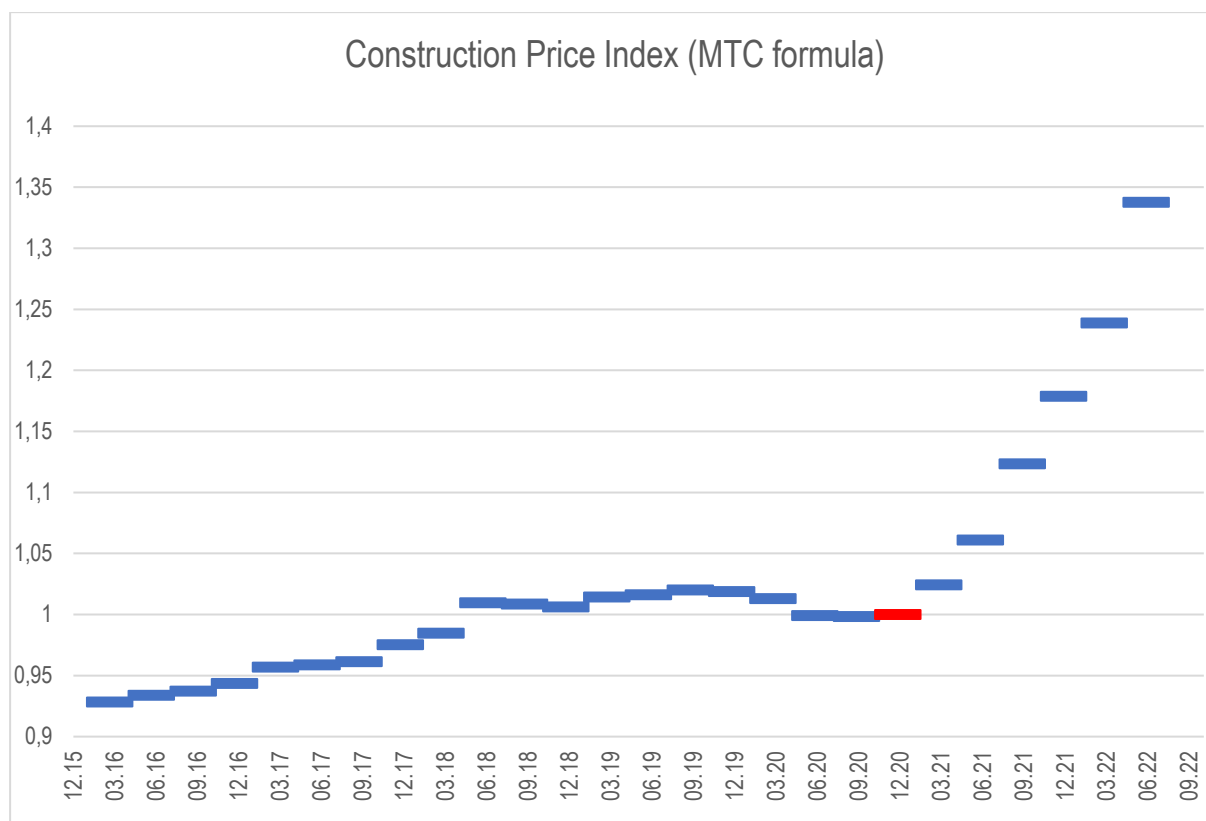
CMI – Price index of constructions works and materials (Indicator Price indices of construction works and materials (2015=100) - quarterly [sp2063qs] - Price indices of construction works and materials (producer prices) for the quarter, published by the Statistical Office of the Slovak Republic on its website www.statistics.sk. The indicator is calculated for 2015 and 2016 from the historical data Price indices of construction works and materials (2010=100) - quarterly [sp2026qs] by weighting the ratio of the index [sp2063qs] and the index [sp2026qs] over the 4 quarters of 2017. The average of these ratios was used to recalculate the index retrospectively.)

The formula assumes that 10% of the contract price will remain fixed over the contract duration, 20% of the increase in contract price is caused by the overall consumer inflation measured by the HICP, 8% of the contract price increase is caused by the increase in the price of diesel and remaining 62% of the contract price is increased due to the rise in the construction materials.

Since the MTC Methodological guideline become effective in June 2022, we have constructed the MTC Construction Price Index in order to estimate the price increase during the analyzed period of December 2020 and June 2022 to see the unified impact of construction price increases on overall public construction investments in Slovakia. The MTC formula for calculation of construction price index have been used in the analysis as a **Scenario 3**.

The graph below shows the development of Construction price index in Slovakia calculated using the MTC formula.

Graph 5 Construction price index (MTC formula)



Source: MTC formula for construction price increase (Inflation clause)

Using the official unified MTC formula for calculating the impact of construction price increases during the last 18 months (December 2020 – June 2022), we should expect a **33.78%** increase in construction prices. However, the graph above shows also an acceleration of the construction prices that spurs additional operational and financial risks for public investments containing construction expenditures in the future.

Overall, using 3 types of indicators, we have created **scenarios for estimating construction cost increases** for the construction investments in the SK RRP. Estimated construction costs increases from December 2020 until June 2022 using the 3 scenarios are presented in the table below.

Table 6 Construction price increase between December 2020 and June 2022 using 3 scenarios

SCENARIO 1	SCENARIO 2	SCENARIO 3
Statistical Office SR – 3 indices (labour, materials, energy)	Eurostat Construction Price Index	Construction Price Index MTC formula for Inflation clause
2020-12 / 2022-06	2022-Q2 / 2020-Q4	2022-Q2 / 2020-Q4
38,25%	24,29%	33,78%

Source: Own elaboration, 2022

Overall, the observed increase in the construction prices in Slovakia have risen between 24.29% and 38.25% depending on the source data. The size of the increase is the main motivation to review the costing in the SK RRP investments containing the construction expenditures and re-estimate expected costs and feasibility of the set targets for these construction investments for each component containing construction investments.

For further analysis and application on the SK RRP construction investments, the Scenario 3, which uses MTC unified approach across the whole public sector as a part of the inflation clause, is applied. By unifying the approach towards addressing construction costs increase across all construction investments and components, NIKA is able to better manage and coordinate line ministries by addressing the construction costs increases across the whole SK RRP.

1.2 Step 2: Projections of expected cost increases up to 2026

This chapter deals with the second step of the methodology focused on the changes in projections and expectations on the future price developments of key components influencing the construction prices, namely: construction materials, labour and energy.

Based on the empirical data presented in the first step, we have showed that from the moment of estimating the costs and creating the benchmarks for the investments in SK RRP in January 2021, the prices of goods and services and especially the prices of construction materials and energy had increased significantly (between 24.29% and 38.25%).

In addition, updated projections from several domestic as well as international (supranational) institutions points at changing environment and overall increased inflation that might become permanent at least in the mid-term of two to three years. These upward revised projections have motivated us to apply new data on inflation projections in order to estimate financial risks for the implementation planned targets.

The general increase has been observed mainly due to the increase in the prices of construction materials and energy. In the following years, prices will increase due to energy price and wage growth increase; and capacity shortage. While private investors can absorb price increases to some extent, material shortages (lengthening lead times, signs of foreign buying of local materials), and shortages of skilled workers are more difficult to correct.

Estimation of the future construction cost increase for the second half of the year 2022 and following years 2023, 2024, 2025 and 2026 was based on the projections of two national institutions – National Bank of Slovakia (NBS) and MoF. More detailed information on the source of data for the projections of the cost groups is provided in the table below.

Table 7 Sources of data for inflation projection

Source	Link
NBS Economic and Monetary Developments 2022 - Summer 2022	https://nbs.sk/publikacie/ekonomicky-a-menovy-vyvoj/
MF SR 60. Meeting of the Macroeconomic Forecast Committee (June 2022)	https://www.mfsr.sk/sk/financie/institut-financnej-politiky/ekonomicke-prognozy/makroekonomicke-prognozy/60-zasadnutie-vyboru-makroekonomicke-prognozy-jun-2022.html

NBS projects the overall inflation for the years 2022 to 2024 in its periodical Economic and Monetary Development Review. The NBS projected inflation is presented in the table below.

Table 8 National Bank of Slovakia - Mid-term projection for price development

Mid-term projection P2Q-2022 – price development [annual growth]					
Indicator	unit	Empirical 2021	2022	2023	2024
- HICP inflation	growth v %, nsa	2,8	10,4	11,1	2,3
Energy prices	growth v %, nsa	0,1	17,2	42,9	-1,5
Food	growth v %, nsa	2,9	12,7	5,4	1,8
Services	growth v %, nsa	4,3	8,6	5,4	3,4
Industrial goods prices excluding energy	growth v %, nsa	2,4	6,3	5,4	3,7
HICP inflation excluding energy prices	growth v %, nsa	3,3	9,2	5,4	3,0
HICP inflation excluding energy and food prices	growth v %, nsa	3,3	7,4	5,4	3,6
Net inflation	growth v %, nsa	3,2	7,5	5,8	3,7
CPI inflation	growth v %, nsa	3,2	10,8	9,8	2,4

Source: NBS, 202211

According to the NBS prediction, “inflation is being driven up mainly by cost factors that are having a significant impact on all inflation components. This situation will continue at least until the middle of next year. Some inflationary pressures are expected to subside next year. Input shortages and logistics bottlenecks related to pandemic-related lockdowns in China should fade, resulting in a slowdown in import price growth. Annual headline inflation is expected to ease in late 2022/early 2023. Despite slowing in 2023, net inflation will remain relatively high in historical terms. The pass-through of commodity price inflation in the previous period will be reflected in goods and services prices”.

The main driver of inflation in 2023, according to the NBS, are administered energy prices. NBS states in its document Economic and Monetary Development Review¹² that “Consumer gas prices (as currently regulated by law) and commodity prices are projected to increase by around 120%. Such a dramatic rise in gas prices stems from wholesale price movements, with more than half of the price data already available and the rest imputed from gas futures contracts. When domestic gas prices are set in the autumn of this year, we assume that the wholesale price will be €66/MWh (when the prices for 2022 were set, the wholesale price was just above €20/MWh). The wholesale price accounts for around 60% of the final consumer price. In the wake of elevated wholesale prices, the prices of gas and electricity would also be expected to spike. However, based on a government memorandum released to the media, we assume that electricity prices will remain stable until 2024. Even so, we consider a possible increase in household electricity prices in 2023 to be an upside risk to the inflation outlook.”

According to the latest projection of the MoF, the inflationary pressures should remain in the economy for the next 3 years. The MoF projection (as presented in the 60th meeting of the Macroeconomic Forecasting Committee in June 2022) expects high inflation for the key construction components and especially for the regulated prices (see table below).

¹¹ available at: <https://nbs.sk/dokument/3ec926e5-c758-426c-a011-e6a881910641/stiahnut/?force=true>

¹² <https://nbs.sk/dokument/3ec926e5-c758-426c-a011-e6a881910641/stiahnut/?force=true>

Table 9 Ministry of Finance - 60th meeting of the Macroeconomic Forecasting Committee - inflation projections

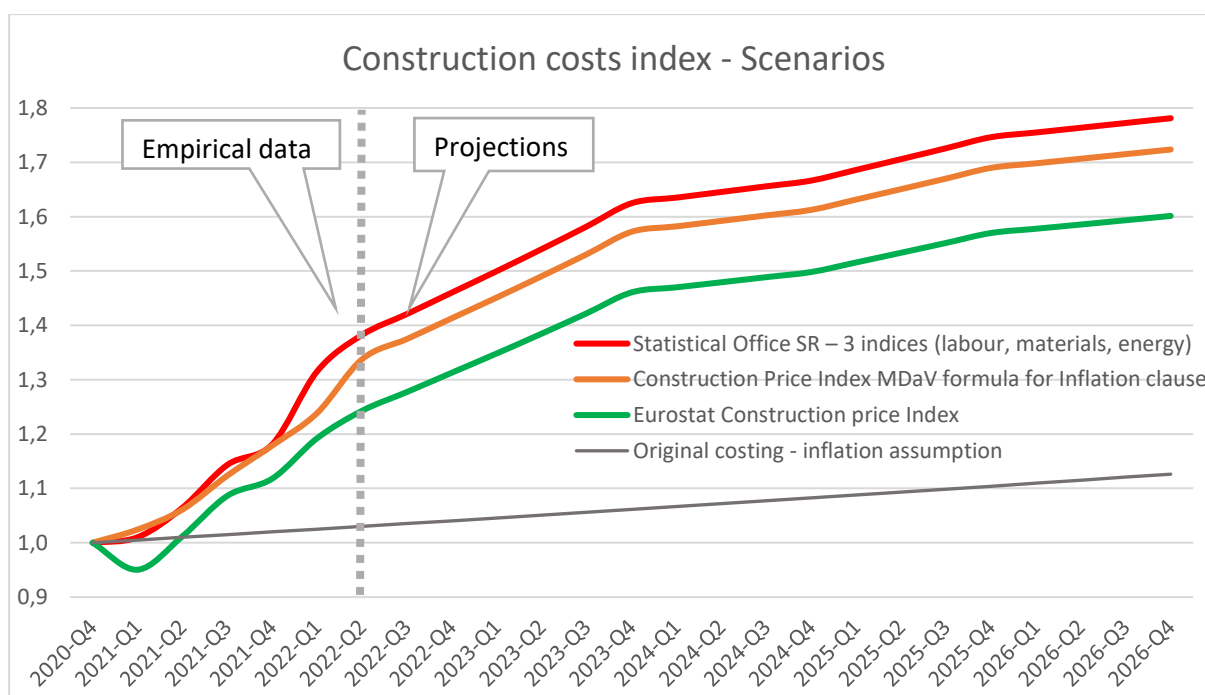
Inflation (in %)	2021	2022	2023	2024	2025
	<i>empirical</i>	<i>prognosis</i>	<i>prognosis</i>	<i>prognosis</i>	<i>prognosis</i>
Consumer price inflation (CPI)	3,2	11,6	11,2	2,6	4,8
Administered prices	-0,7	13,6	39,1	1,1	16,0
Core inflation	3,6	11,1	5,5	2,9	2,5
Food inflation	1,9	13,5	6,4	4,9	4,5
Net inflation	4,0	10,5	5,2	2,3	1,9
Fuel price inflation	17,9	28,0	-2,6	-5,1	-2,9
Tradable goods inflation	2,4	7,5	4,8	2,2	1,7
Market service inflation	5,1	13,1	6,7	3,2	2,8
Consumer price inflation (HICP)	2,8	10,9	11,5	2,6	5,0

Source: MoF, 2022¹³

The table above can be found here: https://www.mfsr.sk/files/archiv/4/Makro_tabulka_MV_jun2022_publ.xlsx

Using the statistical data for creating scenarios and applying MoF data on inflation projections, we present the inflation trajectory for the entire RRP's duration (2021 – 2026) in the graph below.

Graph 6 Comparison of Construction costs index for 3 scenarios



Source: Own elaboration based on Eurostat, Statistical office and MoF data (2022)

¹³ available at: <https://www.mfsr.sk/sk/finance/institut-financej-politiky/ekonomicke-prognozy/makroekonomicke-prognozy/60-zasadnutie-vyboru-makroekonomicke-prognozy-jun-2022.html>

Scenarios are used for the recalculation of expected construction costs increase in SK RRP investments and to estimate the risks for satisfactorily fulfilling the planned targets. Comparing to the initial projections of 2% annual inflation for the entire duration of the plan, the latest estimates predict annual inflation of 10.1%.

Comparing the three scenarios with empirical construction prices increase for the last 18 months and MoF inflation projection with the original inflation projection, the difference in cost increase is between 47.4% and 62.5%. This creates significant financial risks both on the side of expenses as well as the ability to satisfactorily fulfill SK RRP's targets.

Further development in the inflationary pressures were confirmed in September 61st Macroeconomic Outlook by the Ministry of Finance and NBS new inflation projections for 2023 and beyond that are significantly diverging from the EC inflation forecasts for the near future.

As for the inflation predictions for 2022-2025 (HICP), we decided to use national forecasts published by the Ministry of Finance in September 2022 instead of the EC forecasts. The reason for this decision is that the latest EC forecasts are available from July 2022 and do not reflect rapid increase in energy prices observed in following months. Due to this delay, the EC summer forecasts are less realistic and substantially lower compared to national forecasts published by the Ministry of Finance. Moreover, the EC forecast is only for 2022-23 and does not cover years 2024 and 2025.

We also would like to mention that the forecast published by the Ministry of Finance is still lower than the forecast of the Slovak Central Bank which was also published in September 2022. This means that we have chosen more conservative forecast from two relevant national sources.

For comparison, we add a Table comparing forecasts by various institutions:

Table 10 Inflation forecasts by various institutions (as of September 2022)

Inflation forecasts (HICP)	2022	2023	2024	2025
Ministry of Finance (09/2022)	11.6 %	13.5 %	3.6 %	4.1 %
Slovak Central Bank (09/2022)	11.7 %	18.3 %	5.0 %	-
European Commission (07/2022)	10.5 %	8.2 %	-	-

Sources:

MF: https://www.mfsr.sk/files/archiv/38/Makro_tabulka_MV_sep2022.xlsx

NBS: <https://nbs.sk/dokument/f14d92a7-6bfc-44ae-9b68-9a93d08544d6/stiahnut/?force=true>

EC: [Economic forecast for Slovakia \(europa.eu\)](https://ec.europa.eu/economy_finance/forecast-for-slovakia)

The last chapter presents the application of the presented methodology on the Slovak RRF.

2 Impact on the SK RRP's investments

This chapter presents the impact of construction costs scenarios on the SK RRP's investments.

In applying the demonstrated increase in construction costs to the individual components in the SK RRP, we proceeded as follows:

1. We have selected all investments with construction costs according to *Table 4*. In each investment, we have divided the allocation using original costing to get the part of the investment that is planned for the construction (see *Table 4* presented in the previous chapter).
2. According to the allocation timetable for the selected investments from *Table 4*, we discounted the future costs to present value using the 2% inflation value. The SK RRP originally assumed only 2% annual inflation compared to the most recent figure of 10.1% annually. In order to obtain a more objective view on the expected expenditures needed to achieve the planned targets, we discounted original allocations for 2022 to 2026 by an index of 1.02 to get the net present value of the investments containing the construction costs.
3. We then multiplied the selected investments by the Construction Cost Index for 2021 under the 3 scenarios shown in *Graph 6* to obtain the projected construction cost of the investment at the end of 2021.
4. For 2022, we used the empirical value of the increase in the Construction Cost Index presented in the *Graph 6* and half of the MoF's inflation forecast for the year 2022 (*Table 9*).
5. For 2023 to 2025, we used the values of the inflation projections from MoF (see *Table 9*).
6. For 2026, we projected the inflation at 2%.
7. We adjusted each investment in *Table 4* for the expected cost increases in points 3 to 6, taking into account the original proposed allocation to construction, equipment, administrative costs and others. While we index the construction costs according to points 3 to 6, we index the other parts of the investment into the future only by the inflation projected by the MoF.
8. Finally, we estimated a downward revision of the riskiest components using the MTC formula – Scenario 3.

When estimating the cost increase in the construction investments of the SK RRP, we have also taken into account the timing of allocations for specific construction investments.

It should be noted that the inflation risks are present also in the non-construction investments. However as these are not that significant compared to construction costs, we should be able to mitigate these risks and we have retained only the construction investments where the cost increase risk has been identified as the most significant.

Impact of the cost increases on the overall financial sources needed to achieve the SK RRP targets according to the scenarios is presented in the table below.

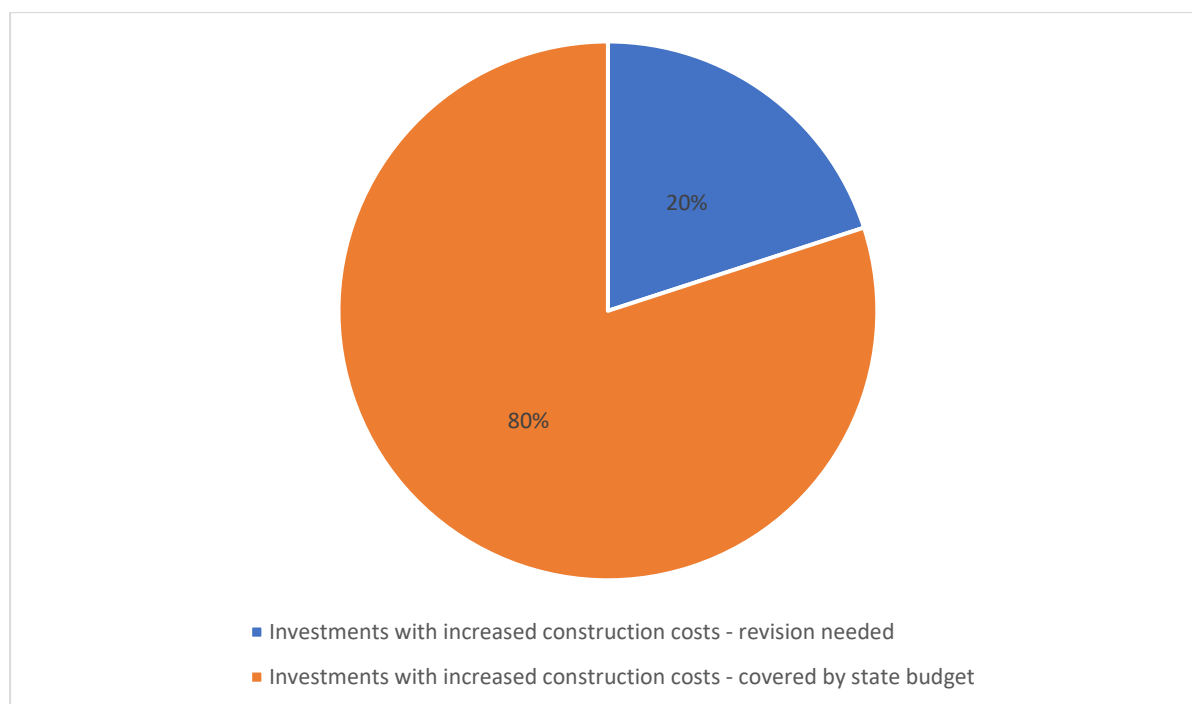
Table 11 Expected costs increases based on scenarios

Component	Original Allocation	Scenario 1 ÚHP (Statistical office - 3 cost components)		Scenario 2 Eurostat Construction Cost Index		Scenario 3 MDaV Construction Cost Index	
		Estimated Cost Increase	Allocation after Estimated Cost Increase	Estimated Cost Increase	Allocation after Estimated Cost Increase	Estimated Cost Increase	Allocation after Estimated Cost Increase
1	231 639 493 €	12,15%	259 789 273 €	12,15%	259 789 273 €	12,15%	259 789 273 €
2	741 455 106 €	46,76%	1 088 132 083 €	34,01%	993 629 125 €	42,67%	1 057 863 029 €
3	801 000 000 €	29,39%	1 036 406 133 €	24,75%	999 282 139 €	27,90%	1 024 515 413 €
4	367 959 656 €	15,19%	423 861 126 €	15,19%	423 861 126 €	15,19%	423 861 126 €
5	158 943 486 €	13,76%	180 814 381 €	13,76%	180 814 381 €	13,76%	180 814 381 €
6	210 041 775 €	26,05%	264 753 417 €	19,59%	251 198 598 €	23,98%	260 411 843 €
7	468 923 110 €	24,16%	582 210 234 €	19,93%	562 372 278 €	22,80%	575 856 188 €
8	213 256 052 €	31,94%	281 366 921 €	23,91%	264 243 283 €	29,37%	275 882 264 €
9	633 228 045 €	16,34%	736 706 488 €	16,34%	736 706 488 €	16,34%	736 706 488 €
10	106 104 426 €	16,96%	124 097 114 €	16,96%	124 097 114 €	16,96%	124 097 114 €
11	1 162 833 850 €	39,06%	1 617 084 647 €	29,92%	1 510 739 523 €	36,13%	1 583 022 578 €
12	104 809 870 €	32,14%	138 500 286 €	24,32%	130 303 733 €	29,64%	135 874 951 €
13	264 771 564 €	30,05%	344 339 482 €	23,32%	326 506 476 €	27,89%	338 627 616 €
14	11 171 987 €	37,80%	15 394 589 €	27,68%	14 264 728 €	34,56%	15 032 697 €
15	255 271 682 €	51,41%	386 518 991 €	35,90%	346 919 833 €	46,45%	373 835 483 €
16	228 604 840 €	22,00%	278 902 310 €	18,45%	270 781 016 €	20,86%	276 301 080 €
17	615 128 079 €	16,17%	714 614 263 €	16,17%	714 614 263 €	16,17%	714 614 263 €
INCREASE		25,75%	1 898 348 720 €	21,18%	1 534 980 356 €	24,29%	1 781 962 768 €
TOTAL	6 575 143 019 €	8 473 491 739 €		8 110 123 376 €		8 357 105 788 €	

Source: Own elaboration, 2022

Based on the scenarios, we can assume that the overall costs for the RRF components will increase between 21% and 26%. This includes the impact of retail price inflation and construction costs increases on all investments Presented in monetary terms, increased allocation is between EUR 1 535 million and EUR 1 898 million. Estimating the cost increase for the entire SK RRP led us to look closely at the investments that possess the highest financial risks regarding the construction costs.

Graph 7 Investments with construction costs increased risk – covered by state budget vs. revision needed



Source: Own elaboration, 2022

Based on a detailed analysis we have identified 50 investments across SK RRP which are considered risky in terms of the effect of construction costs increase. From this total number we have further selected 10 large-scale investments that cover the largest increase of costs and are therefore considered the most sensitive considering the implementation of SK RRP as well as their major impact on the state budget. We have therefore chosen a pragmatic approach with the aim of partial revision of SK RRP in order to maintain its level of ambition and implementation capacity, mainly associated with tenders that need to be announced urgently in the interest of potential beneficiaries.

The costs associated with the increase of construction materials in 40 remaining less sensitive investments will be covered from the state budget as to mitigate the implementation risk. However, the remaining 10 high-risk investments need to be adjusted by reducing their financial allocation and/or CID target based on the calculations resulting from this methodology, taking into account the increase in inflation associated with the current geopolitical events as well. The table below shows 10 main investments which have been identified and are subject to revision. It should be noted that the revision of these investments have been carefully considered on all levels and this approach aims at maintaining effective and ambitious implementation of SK RRP.

We have reviewed the investments within components oriented on transportation (C3), education (C6, C7 and C8), health (C11, C12 and C13), and judicial reform (C15). These components contain the highest share of construction costs. If the resources are limited, there should be downward revision of the targets in SK RRP. We have used the Scenario 3 (MTC Construction Cost Index) for their revision. The required downward revision of targets in the components most affected by construction cost increase is presented in the table below.

Table 12 Downward revision for selected investments

Component / Investment	Original allocation	Estimated Cost Increase	Targeted Downward revision
3 – Sustainable transport			
<i>Investment 1: Development of low-carbon transport infrastructure</i>	661 255 279 €	16%	-14%
6 – Accessibility, development and quality of inclusive education			
<i>Reform 1: Ensuring conditions for the implementation of compulsory pre-primary education for children aged of five and introducing a legal entitlement to a place in kindergarten or other pre-primary education providers from the age of three.</i>	146 686 435 €	37%	-36%
7 – Completion of the school infrastructure			
<i>Investment 2: Elimination of the double-shift schools</i>	106 948 206 €	36%	-26%
8 – Improving the performance of Slovak universities			
<i>Investment 1: Support for the strategic development of universities</i>	203 941 566 €	60%	-38%
11 – Modern and accessible healthcare			
<i>Investment 2: New hospital network - construction, reconstruction and equipment</i>	998 479 813 €	57%	-37%
12 – Building psycho-social centres			
<i>Investment 3: Building psycho-social centres</i>	33 664 319 €	30%	-23%
13 – Accessible and high-quality long-term socio-health care			
<i>Investment 1: Enhancement of community-based social care capacities</i>	193 723 429 €	57%	-37%
<i>Investment 2: Extension and restoration of after-care and nursing capacities</i>	31 509 307 €	54%	-36%
<i>Investment 3: Extension and restoration of palliative care capacities</i>	19 939 401 €	54%	-36%
15 – Reform of the judiciary			
<i>Investment 1: Reorganisation of courts – renovation of buildings</i>	212 355 852 €	56%	-37%
TOTAL	2 608 503 608 €	48%	-34%

Source: Own elaboration, 2022

Downward revision of the targets would allow for better management and an effective implementation of the SK RRP considering the new economic circumstances and deliver reasonable outcomes.

3 Final methodology for the selection of the investments and the revision of targets due to the construction costs increase

Based on the analysis presented in the previous chapters, we have identified two questions to be considered for the RRF investments targets revision:

1. How to select investments for the revision due to the construction costs increase?
2. How to comprehensively estimate the construction costs increase in order to set the required downward target revision?

Investments selection for the revision should follow two key requirements that should be fulfilled simultaneously:

- a) The investment contains significant share of construction costs. This requirement follows the logic, that investments containing mostly non-construction costs should be excluded from the revision as the non-construction investments have not been hit significantly by the construction costs increases.
- b) The investments should be owned by public bodies. This requirement follows the legal requirement that the investment is fully owned by the public body or the organization that is under full managerial control of a public body. For example, if the investment is directed into the construction of a hospital that is owned by a private body, the construction costs increases should be covered by a private investor/owner. However, if the investment is directed into the construction of a hospital that is and will be fully owned by a public body (line ministry or a public organization set-up and controlled by a public body), the ability of a public body budget to cover the construction costs increases is limited and therefore the investment should be subject to the downward target revision and not the cost increases.

The estimation of the construction costs increase should follow the previous analysis and presented scenarios. Combination of empirical data on the construction costs increases with the projections on general consumer inflation should be used as a basis for calculation of expected costs increases and respective downward targets revision. In order to set the earliest data from which the construction costs increases should be estimated, the data of the RRF adoption was set (July 2021). Empirical data on construction costs increase has been used until the latest known figure (Q3/2022). This data has been used as a “cut-off” date for the empirical data and since Q3/2022 the projections are going to be used. At the same time, the data source should be the Eurostat database in order to avoid potential errors on local markets.

For the final estimation of construction costs increases, we have used two indicators. One for the empirical estimation of construction costs development in Slovakia and the second one for the inflation projections. More specifically, we have used **quarterly** data on:

- i. Output price index in construction for construction producer prices or costs, new residential buildings– Eurostat code STS_COPI_Q until Q3/2022¹⁴
- ii. EC Inflation forecasts for Slovakia - The latest macroeconomic forecast for Slovakia¹⁵.

The combination of the two price indices are presented in the table below.

¹⁴ Available at:

https://ec.europa.eu/eurostat/databrowser/view/STS_COPI_Q/default/table?lang=en&category=sts.sts_cons.sts_cons_pri

¹⁵ Available at: https://economy-finance.ec.europa.eu/economic-surveillance-eu-economies/slovakia/economic-forecast-slovakia_en

Table 13 Final combination of price indices for the estimation of construction costs increases

Indicator / Year	Q1/2021	Q2/2021	Q3/2021	Q4/2021	Q1/2022	Q2/2022	Q3/2022	Q4/2022	2023	2024	2025	2026
Inflation index (HICP) - EC Autumn forecast 2022 (for Q4/2022 onwards)	109,4	110,7	112,2	113,8	118,7	123,7	127,0	129,4	13,9%	3,6%	2,0%	2,0%
Construction cost Index (Eurostat Output price index in construction) - STS_COPI_Q	111,1	118,3	127,0	130,7	139,4	145,3	151,0	101,89				

Source: Own elaboration, 2022

Taking into account the fact that the original costing procedure uses the 2% p.a. inflation, the methodology considers removing this accounted inflation. The final expected construction costs increases per years of RRF duration are presented below.

Table 14 Final Construction costs increase index used for the targets downward revision

Construction costs increase index (New projections - Initial inflation expectations)					
2021	2022	2023	2024	2025	2026
8,5%	15,6%	11,9%	1,6%	0,0%	0,0%

Source: Own elaboration, 2022

Combining previously suggested procedure for the investments selection with the procedure on the estimation of the construction costs increases, we can estimate the impact on targets downward revision. The final list of investments that shall be subject to the targets downward revision is presented in the table below.

Table 15 Final list of investments subject to the construction costs increase revision

Associated action (reform or investment)	Initial allocation TOTAL (investments)	Article 21 - Construction costs increase	Article 21 - Target revision (v %)
3 - Sustainable transport - Investment 1: Development of low-carbon transport infrastructure	431 600 000 €	39,43%	-28,28%
6 - Accessibility, development and quality of inclusive education - Reform 1: Ensure conditions for the implementation of compulsory pre-primary education for children aged 5 and above and the introduction of a legal entitlement to a place in a kindergarten or other pre-primary education providers from the age of 3.	39 277 652 €	35,28%	-26,08%

6 - Accessibility, development and quality of inclusive education - Reform 1: Ensure conditions for the implementation of compulsory pre-primary education for children aged 5 and above and the introduction of a legal entitlement to a place in a kindergarten or other pre-primary education providers from the age of 3.	102 298 198 €	35,63%	-26,27%
7 - Education for the 21st century - Investment 2: Completing school infrastructure	106 948 206 €	40,34%	-28,75%
8 - Improving the performance of Slovak universities - Investment 1: Support for the strategic development of universities	61 747 193 €	40,75%	-28,95%
8 - Improving the performance of Slovak universities - Investment 1: Support for the strategic development of universities	138 216 416 €	40,44%	-28,79%
11 - Modern and accessible healthcare - Investment 2: New hospital network - construction, renovation and equipment	53 839 571 €	33,47%	-25,08%
11 - Modern and accessible healthcare - Investment 2: New hospital network - construction, renovation and equipment	944 413 330 €	40,17%	-28,66%
13 - Accessible and quality long-term social and health care - Investment 1: Expansion of community social care capacities	181 112 779 €	41,82%	-29,49%
13 - Affordable and quality long-term social and health care - Investment 2: Expansion and renewal of aftercare and nursing care capacities	29 643 356 €	38,50%	-27,80%
13 - Accessible and quality long-term social and health care - Investment 3: Expansion and renewal of palliative care capacities	19 939 401 €	38,50%	-27,80%
15 - Reform of the judiciary - Investment 1: Reform of the judicial map - Reorganisation of the courts - Renovation of buildings	62 392 001 €	37,92%	-27,50%
15- Reform of the judiciary - Investment 1: Reform of the judicial map - reorganisation of the courts - Construction/acquisition of new buildings	146 040 713 €	37,92%	-27,50%

Source: Own elaboration, 2022

The final list contains 9 investments that should be the subject of targets downward revision under the Article 21 due to the unexpected and unforeseen construction costs increase. For these investments it is not rational to expect that the owner of the investment is in the financial condition to cover the costs increase risks (financial risks) and therefore operational risks of not achieving the set targets emerges and cannot be managed internally.

4 Conclusion

The review of construction cost increases in the components of the SK RRP is essential for the responsible management of the overall plan. Reflecting on the significant increases in construction costs that we have seen in the last 18 months, it is imperative to adjust and update the expectations and targets to reflect the new economic realities.

In detailed revision of the costs, we have re-priced projects in component 6 (kindergarten) and demonstrated the price increases. We have taken a different approach to demonstrate increases for construction of elementary schools in the component 7, where we have demonstrated a price increase of approximately 13% for 2021 through the difference between the projected price and the procurement output (ECV) as presented in the *Table 3*.

In order to establish the significance of the risk of price increases for construction materials and works by a uniform approach, we have constructed 3 different indicators which we have presented as scenarios. The first indicator was compiled by the MoF's ÚHP using 3 cost items (construction materials, energy and labour). The second indicator works with the construction index from the Eurostat database (scenario 2). The third scenario works with a formula from MTC, which is used as a uniform approach in Slovakia from June 2022 for the revaluation of construction investments and serves as an inflation clause for the new contracts in order to prevent the uncertainty of future developments from being factored into the current price.

The unprecedented increase in the price of construction materials in 2022 has also led us to reassess and reflect the increase in construction costs, with construction prices rising by 13.47% in the first half of the year alone according to the MTC formula, which is higher than the MoF's inflation estimates for the whole of 2022.

Applying the scenarios to construction investment in the components of the SK RRP, we showed that the increase in construction costs was between 24.29% and 38.25% by June 2022 alone. We have also used the new projections for inflation from the MoF, which suggest a higher inflation continuing in the upcoming years. For the application on the construction costs across the SK RRP, we have applied the Scenario 3 that uses unified approach across the entire public sector and uses unified formula for the calculation of construction costs.

Thus, we have revalued the individual components of the SK RRP that include construction investment to present value while applying MoF's projections for future inflation. We have thus obtained a realistic picture of the expected increase in the cost of implementing investments in the SK RRP, where we can expect increases of EUR 1.5 billion to EUR 1.9 billion, i.e. between 21% and 26% (*Table 11*).

Consequently, we focused on addressing inflation risks by consulting the likelihood of fulfilling the targets in the respective components with the ministries affected by the impacts of construction price increases. We identified 9 investments at risk where the impact of construction cost increases threatens fulfillment of target, which need to be revised as a result. In case of risky investments, we have elaborated final methodology combining the empirical data on construction costs increases and inflation projections using Eurostat and EC data. The proposed methodology on the selection of risky investments as well as the calculation of cost increases (*Chapter 3*) could serve the EC to guide the RRFs administrators on the identification and treatment of their investments when considering the transparent usage of Article 21. We have also calculated the need to reduce the targets, by applying the proposed final methodology and presented them in *Table 15*.

By downward revision of the targets in 9 risky investments, we can better manage other inflation risks in the remaining components and ensure satisfactory fulfillment of the targets across the entire SK RRP.