

# International Scientific and Practical Conference “BRICS Water Forum”

## Efficiency evaluation of water utilities: international initiative

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29-30 September, 2016

# Agenda

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- ✧ Why do we need regulation?
- ✧ Current trends in regulatory practices
- ✧ Project introduction and methodology
- ✧ Results: international and national benchmarking
- ✧ Conclusions
- ✧ International Initiative

# Why do we need regulation?

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- ✧ Prevent market failures caused by regional monopolization
- ✧ Provide residential and industrial consumers with price-adequate and qualitative water supply
- ✧ Keep the balance between water companies' and consumers' interests
- ✧ Investments for sustainable sector development

# Current trends in regulatory practices

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- ✧ Trend toward use of incentive regulation and benchmarking
- ✧ Development of advanced tools to evaluate companies' efficiency
- ✧ Use of efficiency scores to set tariffs or to support decision-making process

# Current trends in regulatory practices

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**BENCHMARKING:** Approaches to estimate relative performance of comparable firms against a benchmark (the best peer(s), standard, average industry performance, etc.).

B. studies provide important information regarding the relative performance of firms who face comparable production conditions.

[Based on Glossary of BoKIR, PURC]

# Current trends in regulatory practices

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Benchmarking can differ

- ✧ By scope: international or national
- ✧ By techniques: metric/qualitative/ process benchmarking (analyses and comparisons of firm operating characteristics in the vertical production chain; frontier/nonfrontier; deterministic/stochastic; parametric/nonparameric.

# Project introduction

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- ✧ Carried out under the HSE Basic Research Program
- ✧ Aims at evaluating efficiency of Russian water supply companies' at the national and international levels
- ✧ Employs a combination of statistical and mathematical methods
- ✧ 692 companies from 8 countries for international benchmarking (divided in 6 clusters in quartile analysis)
- ✧ 29 large Russian private and public-owned companies for national benchmarking (drawn from the same cluster)

# Methodology

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- ✧ International benchmarking

  - ✧ Ranking of performance scores

  - ✧ Dynamic analysis

  - ✧ Quartile analysis

  - ✧ Comparison of averages

- ✧ National benchmarking

  - ✧ Corrected ordinary least squares (COLS)

  - ✧ Data envelopment analysis (DEA)



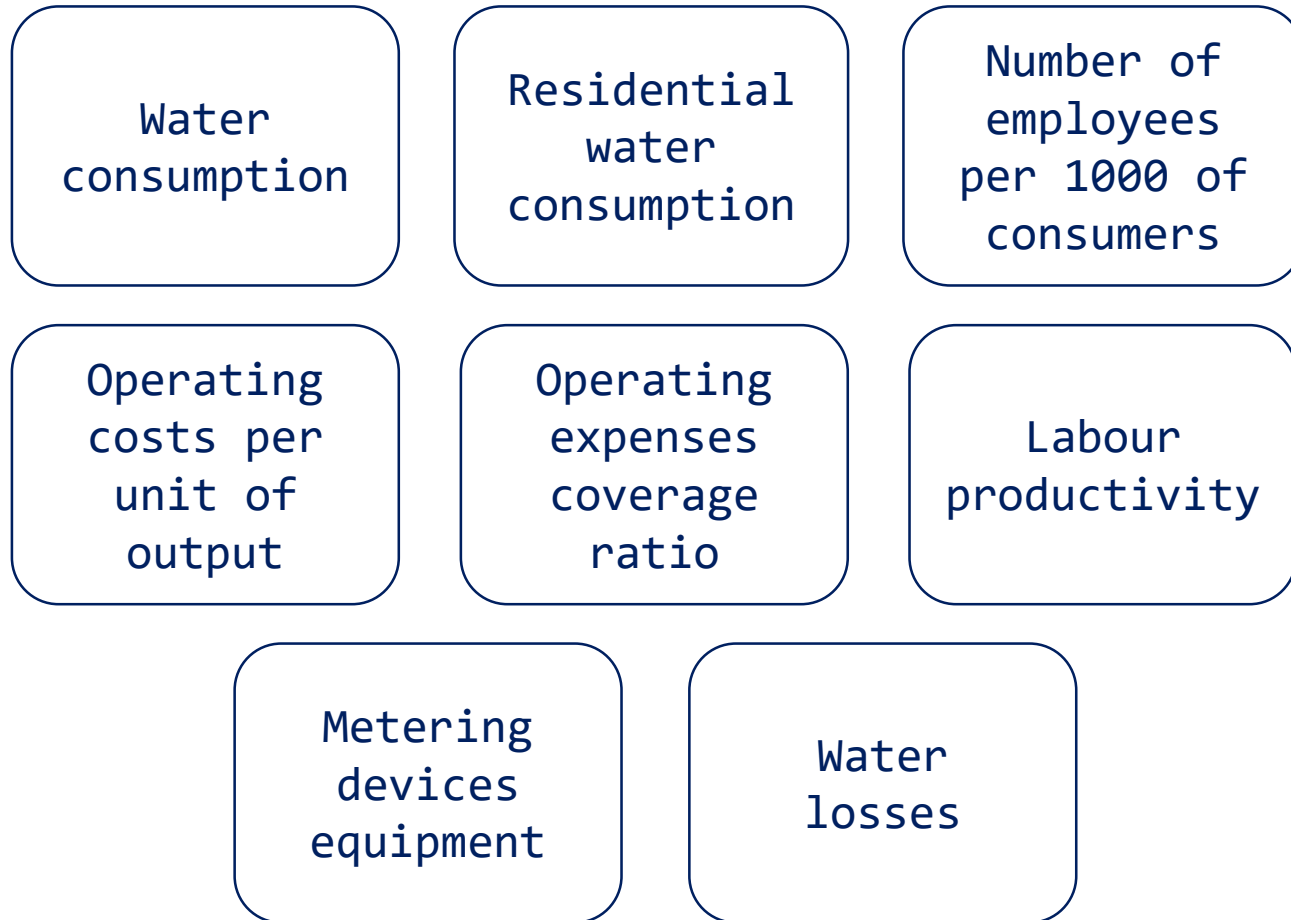
# International benchmarking: Data

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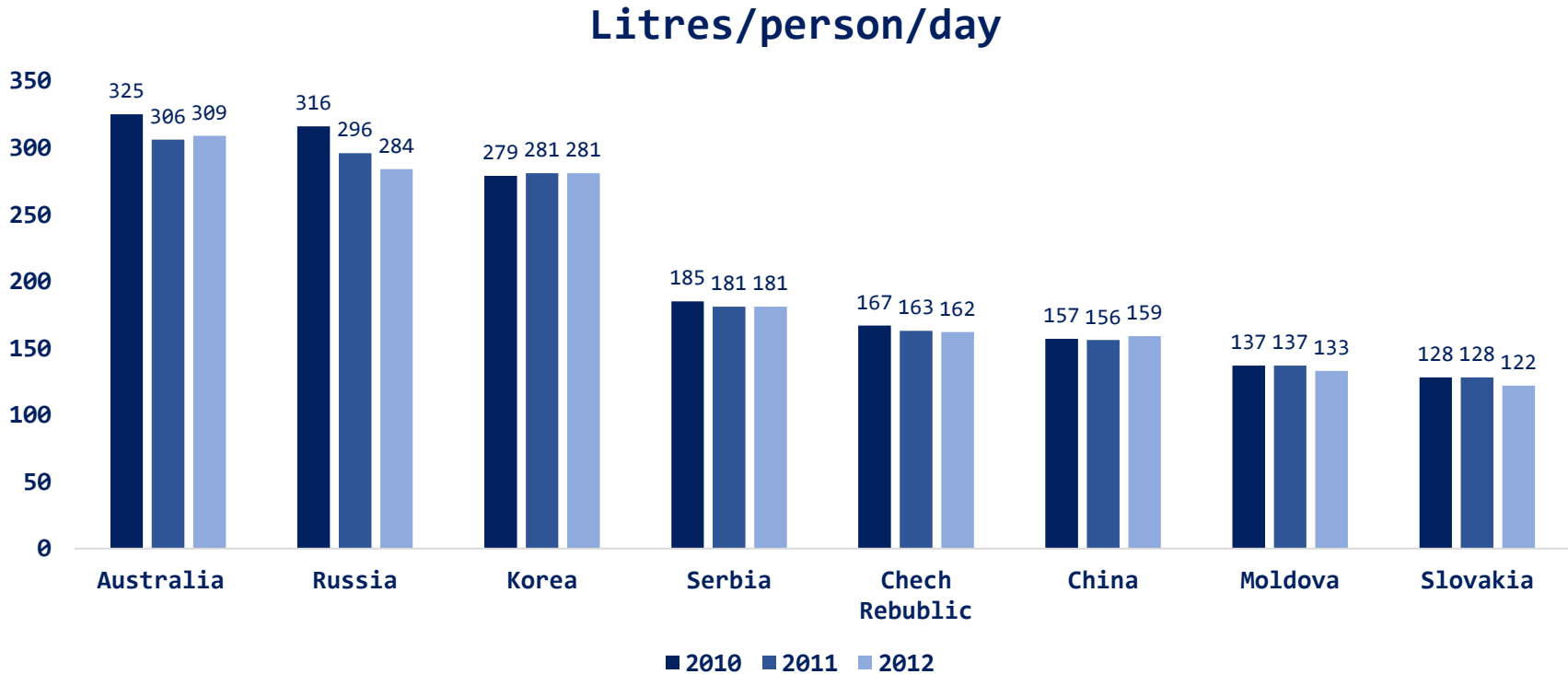
#	Country	Number of companies
1	Australia	110
2	China	59
3	South Korea	190
4	Moldavia	41
5	Russia	168
6	Serbia	30
7	Slovakia	70
8	Czech Republic	24
-	Total	692

# International benchmarking: Indicators

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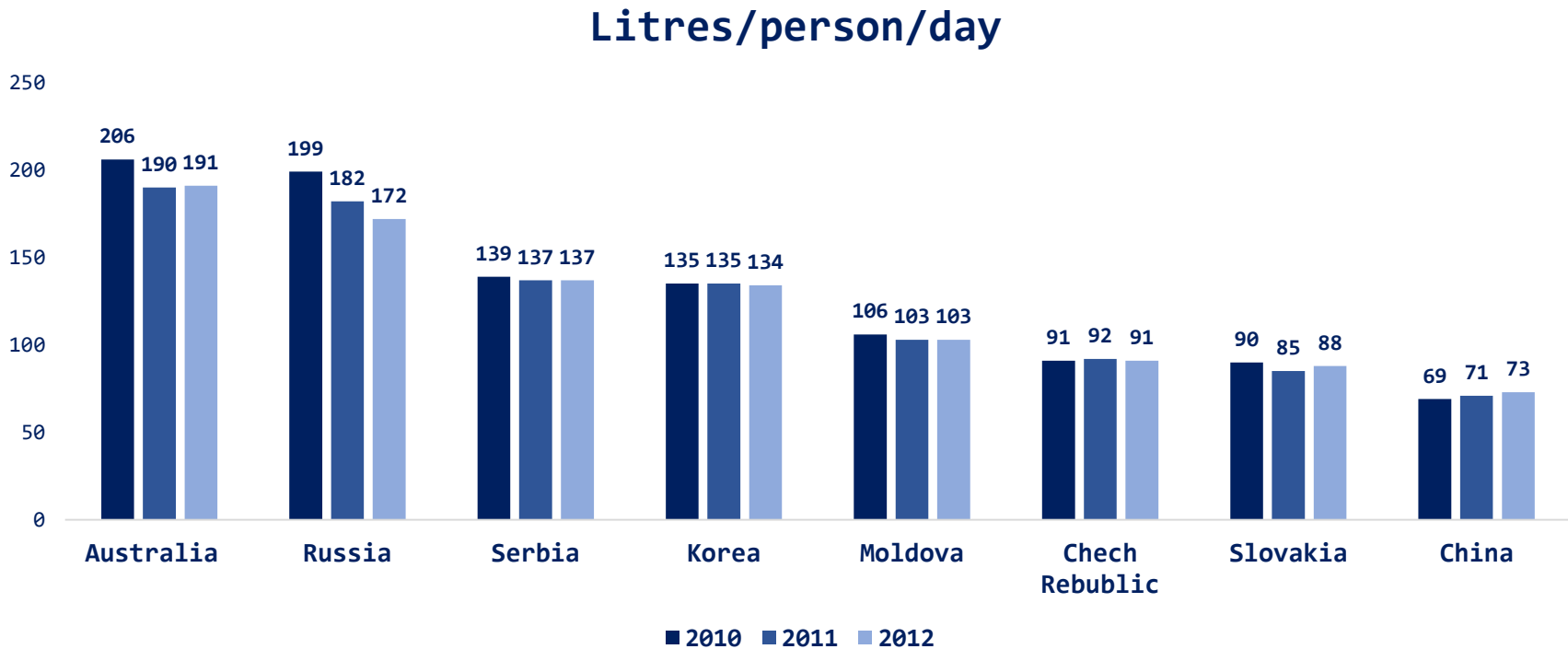


# International benchmarking: Total water supply



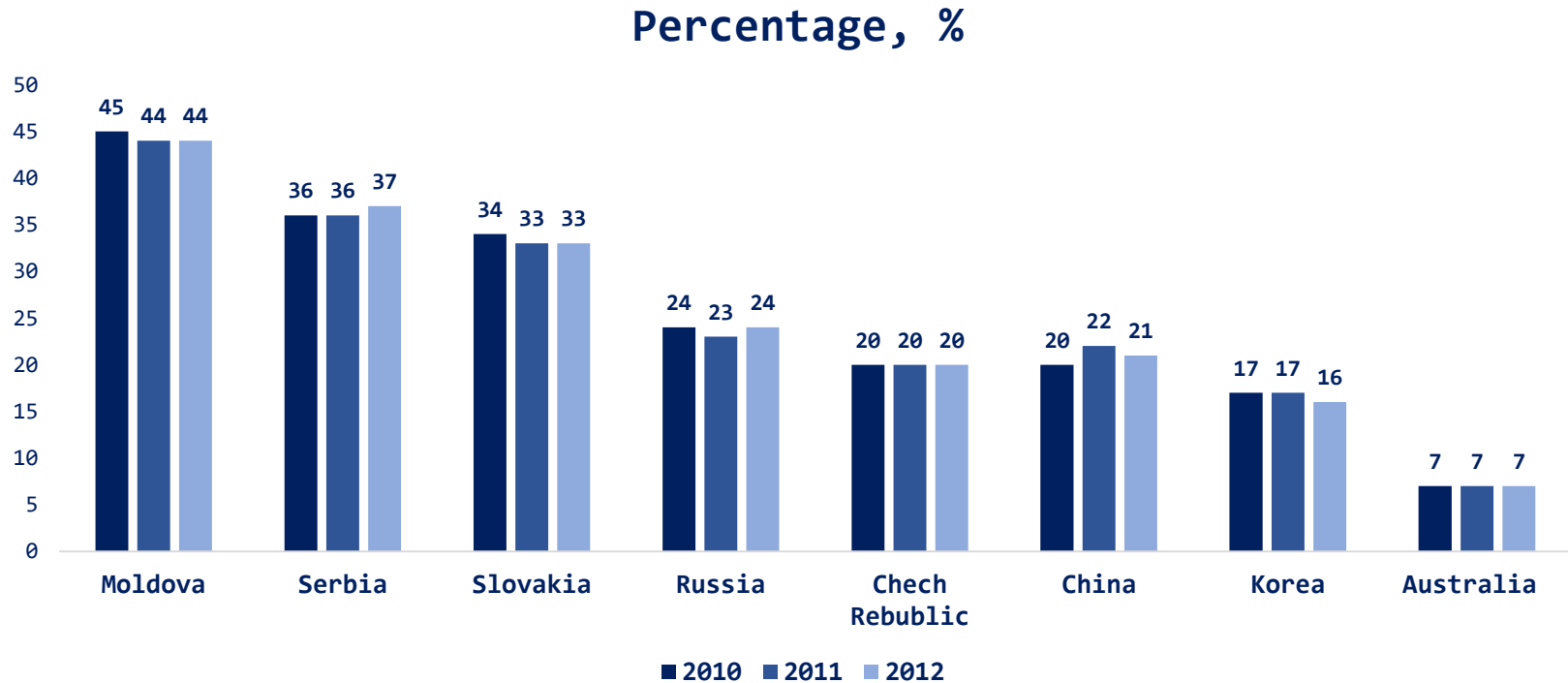
Russian companies are at the second place in daily water production per person, second only to Australia. Consumption rate decreases from year due to increase of consumption efficiency.

# International benchmarking: Residential water supply



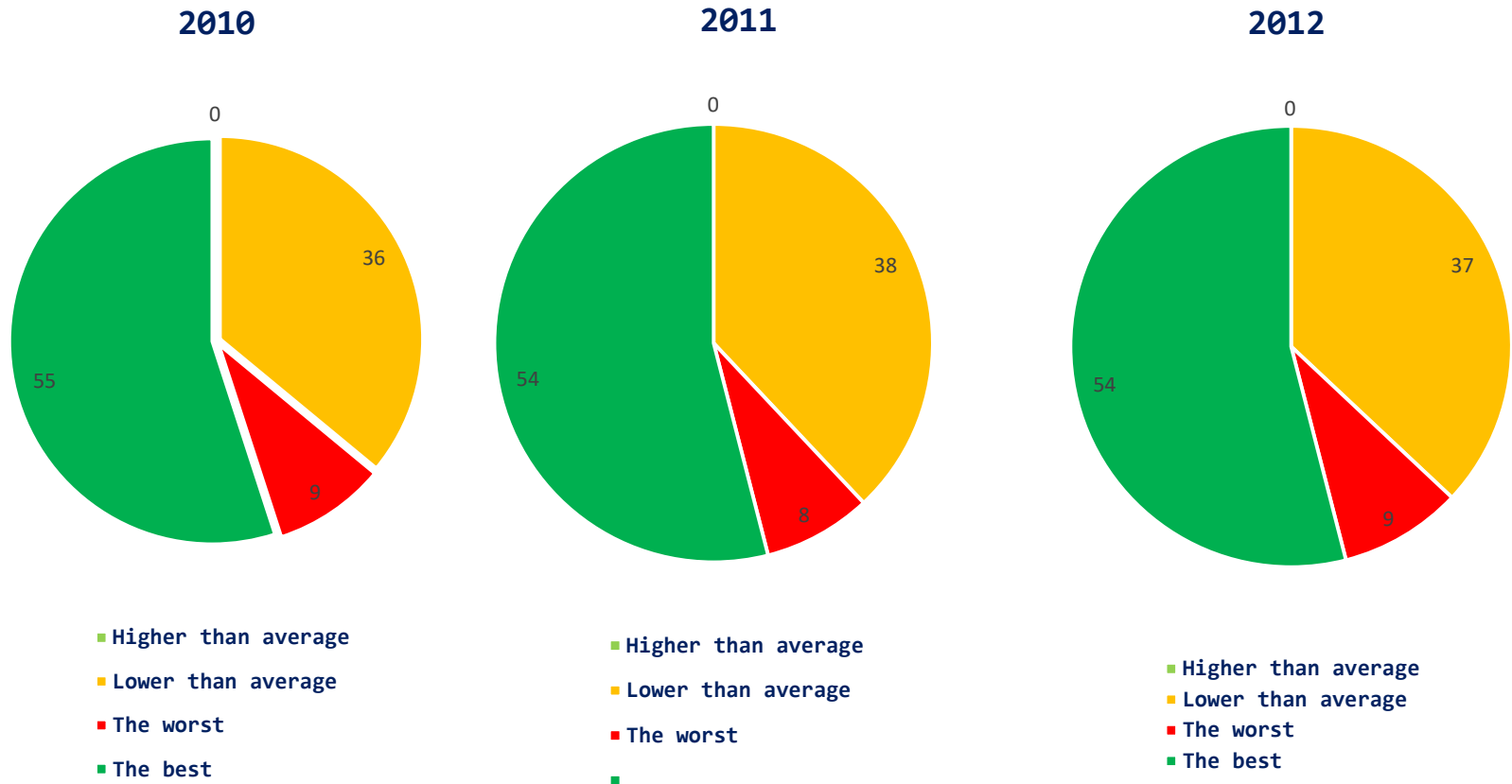
Russian companies are second only to Australia in daily residential water supply. Consumption rate decreased by 16% from 2010 to 2012. However, it's more than 200% larger than in China.

# International benchmarking: Share of losses in total production



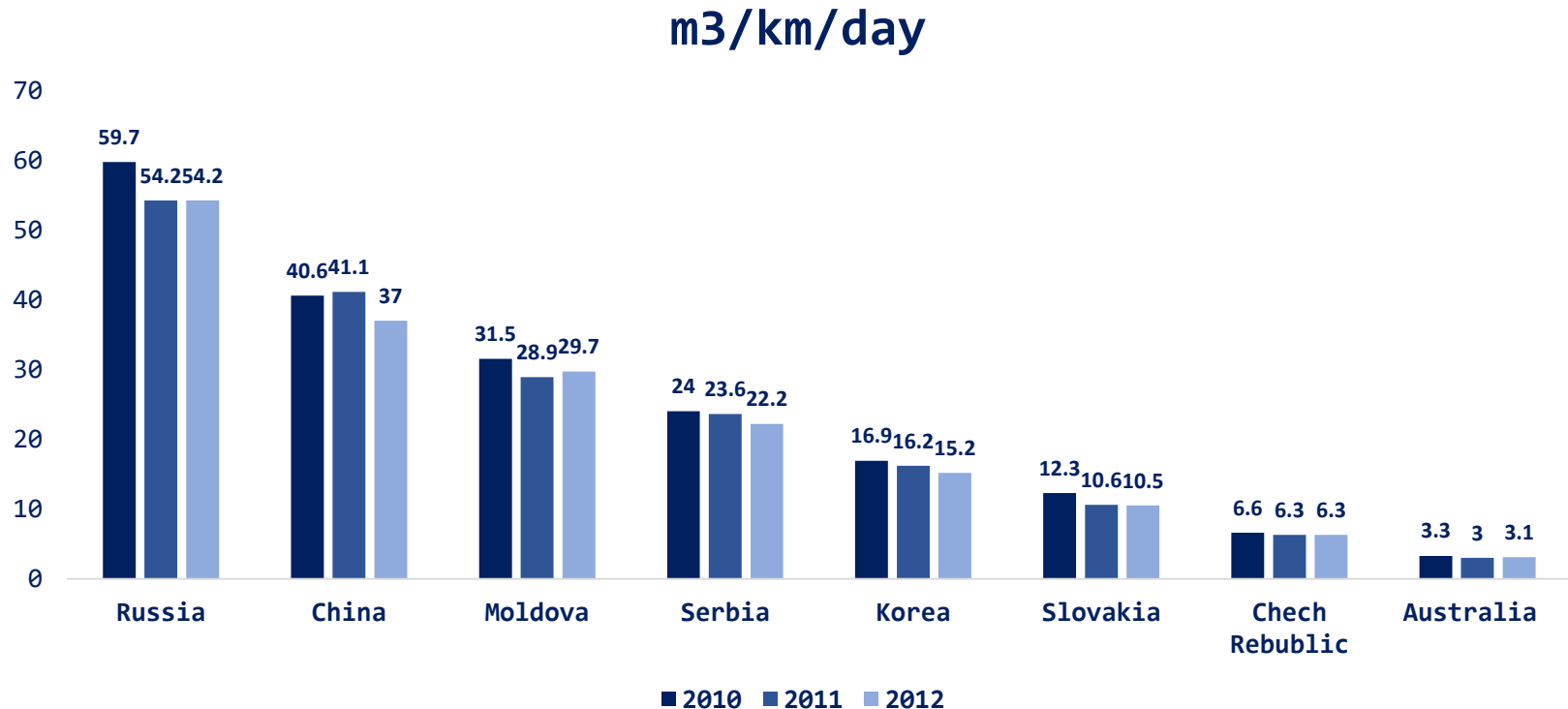
The share of water losses in the total production of Russian companies remains the same from year to year and corresponds to the average values in the sample.

# International benchmarking: Share of losses in total production



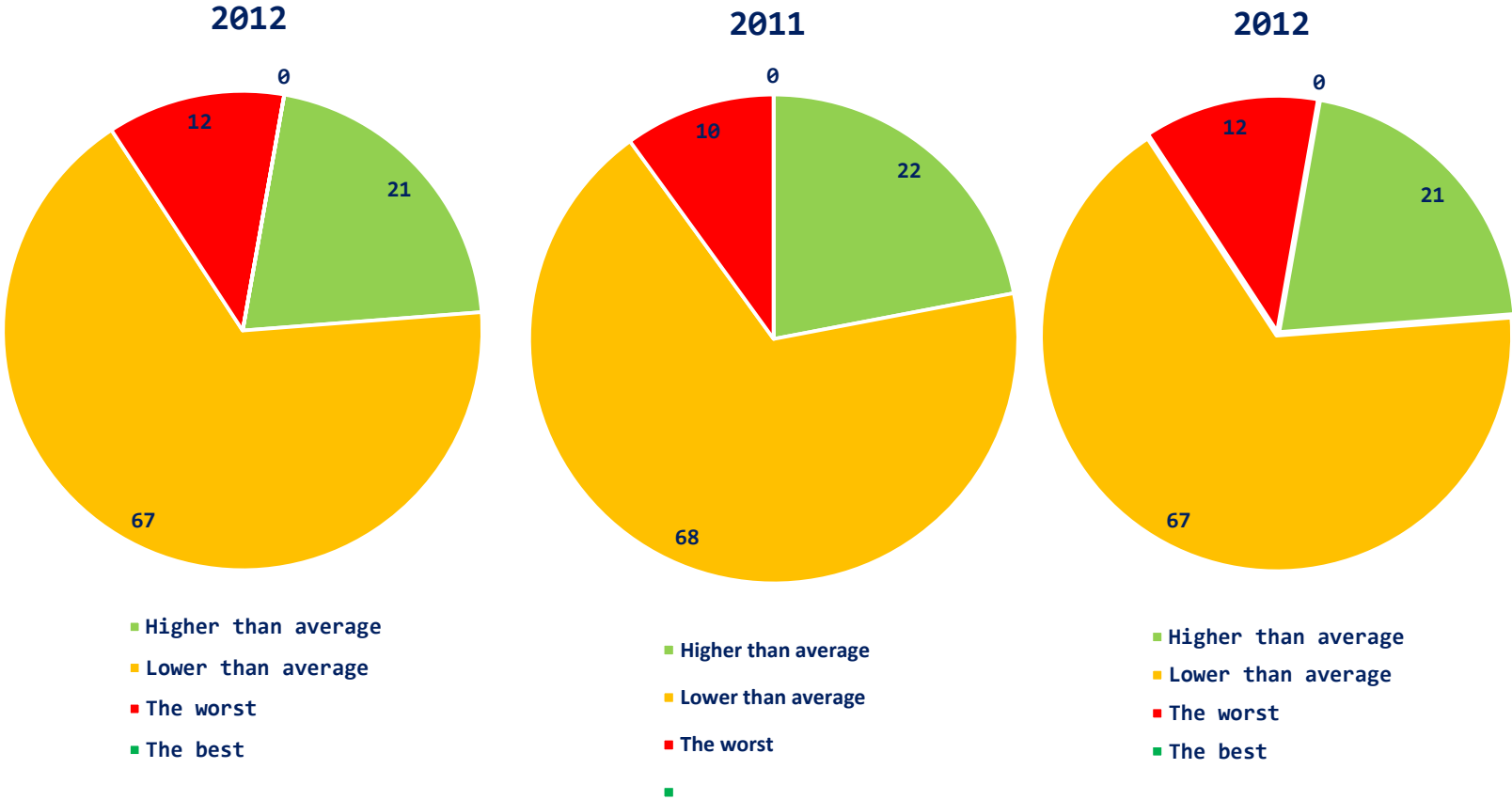
No Russian company from any cluster enters into the first quartile of the companies with the least losses. But there are many companies that demonstrated higher than average results.

# International benchmarking: Losses per length of pipelines



Water losses as an absolute value per 1 km of pipeline length, however, places Russian companies to the first position in the ranking. At the same time, Russian companies demonstrate the tendency to improve this indicator.

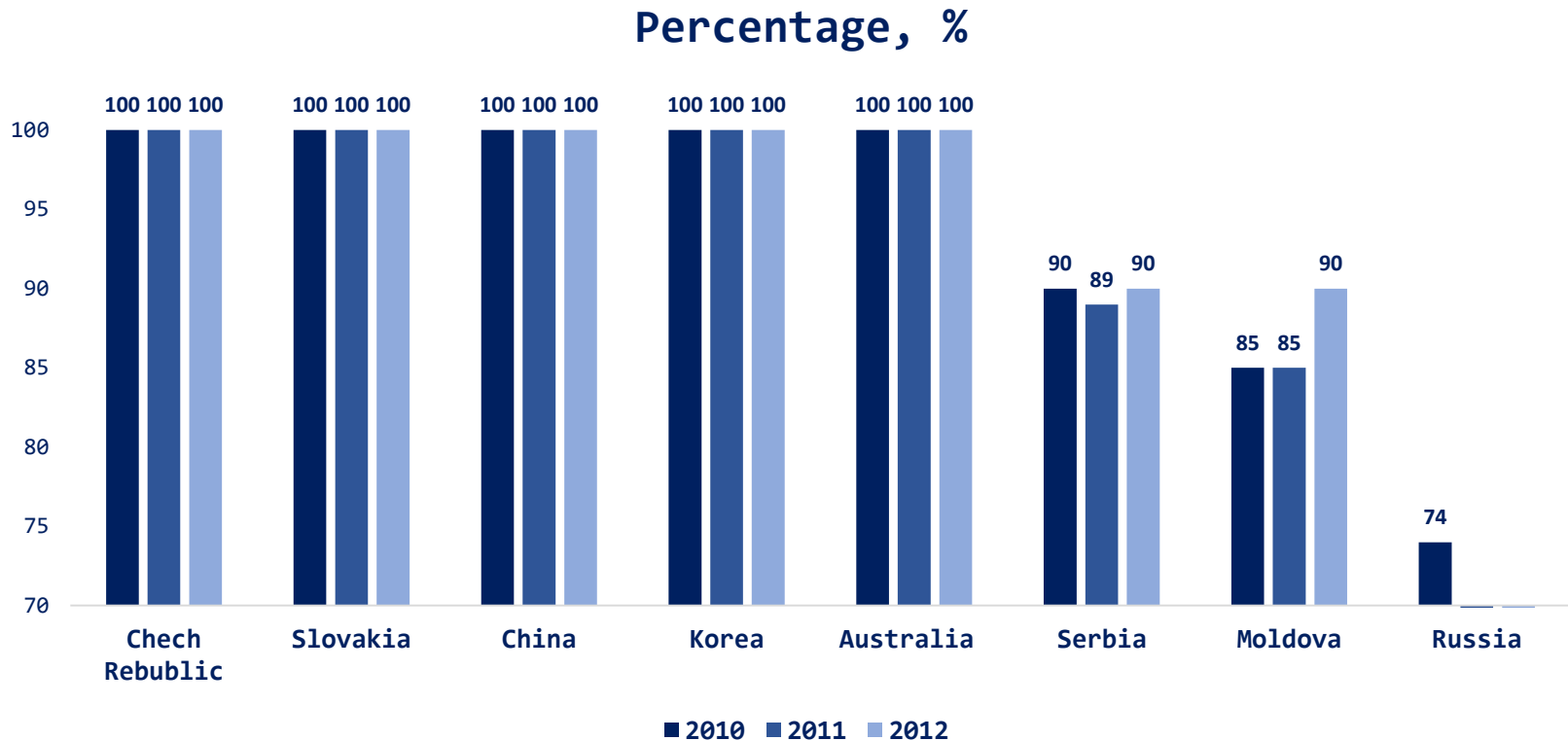
# International benchmarking: Share of losses per length of pipelines



Quartile analysis in clusters shows that the largest part of the Russian companies demonstrate lower than average results which could be explained by a significant share of aged pipelines belonging to the Russian companies

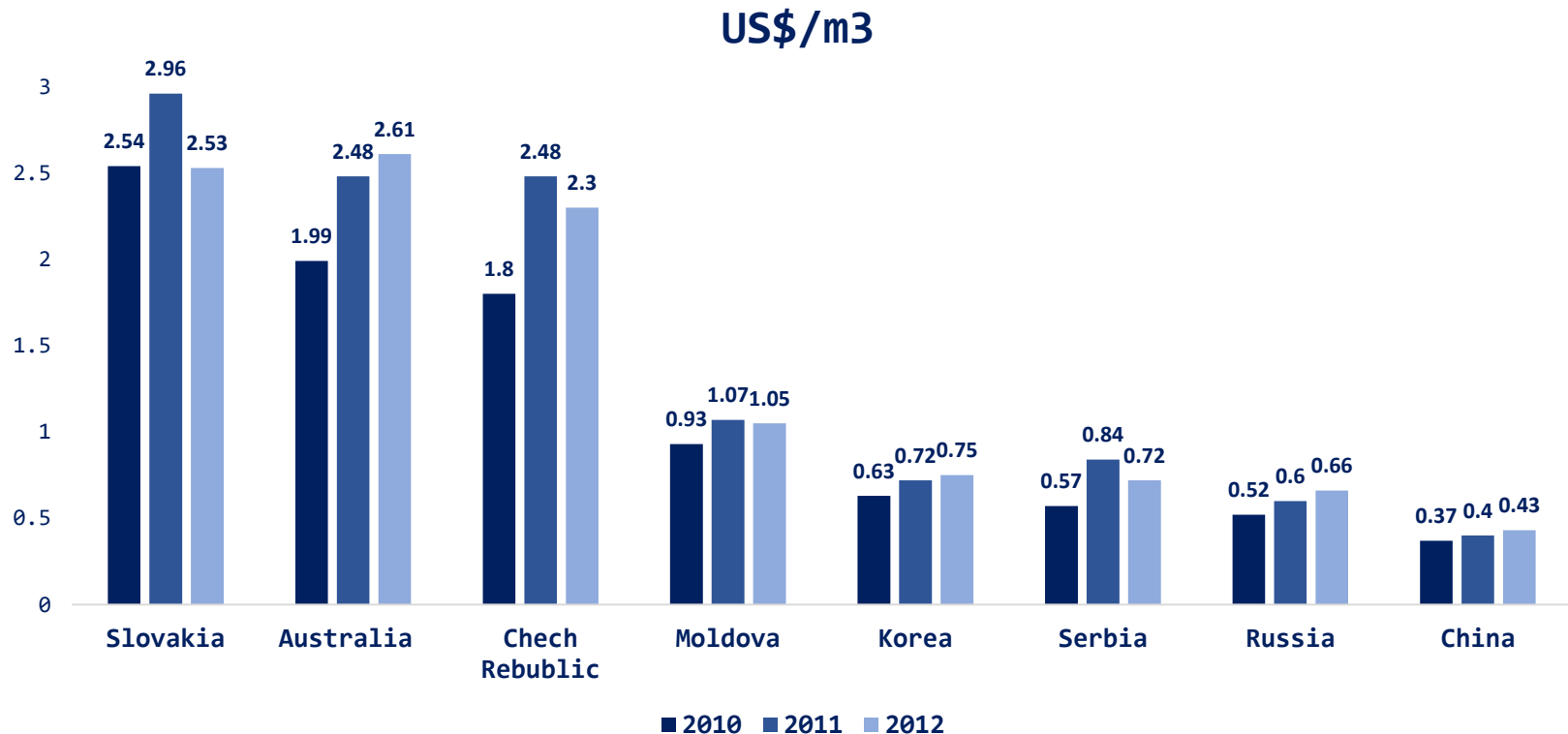


# International benchmarking: Metering devices equipment



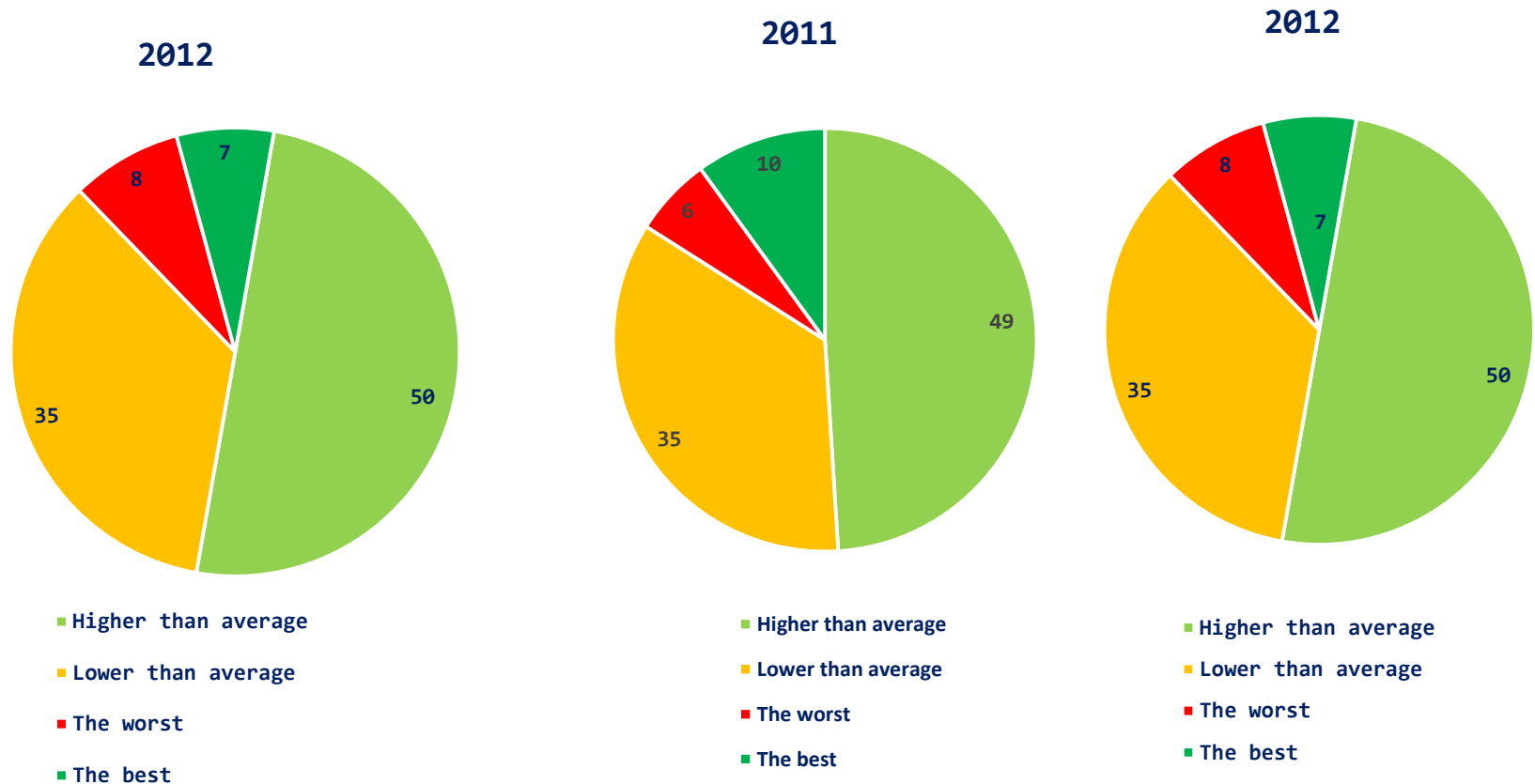
Russian companies demonstrate the worst equipment of metering devices. The majority of Russian companies did not release the data on this indicator corresponding to 2011 and 2012 years. It might be assumed that the position is currently improved due to huge government and municipal support.

# International benchmarking: Operating expenses per output



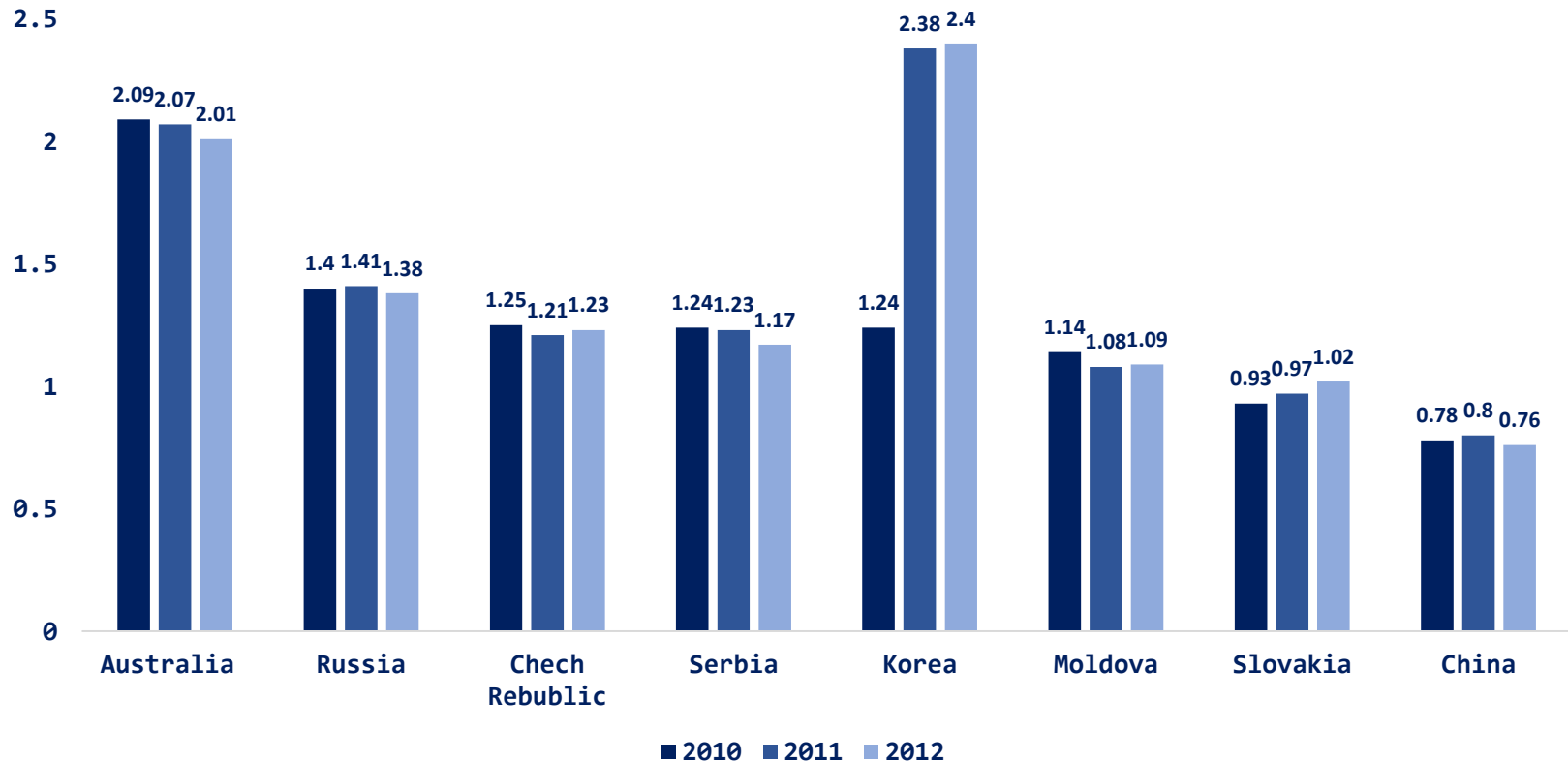
Russian companies are second only to China in the efficiency of operating expenses and at the same time demonstrate the positive tendency in this respect.

# International benchmarking: Operating expenses per output



Russian companies demonstrate comparatively high efficiency of operating expenses, especially in clusters with companies functioning in big cities

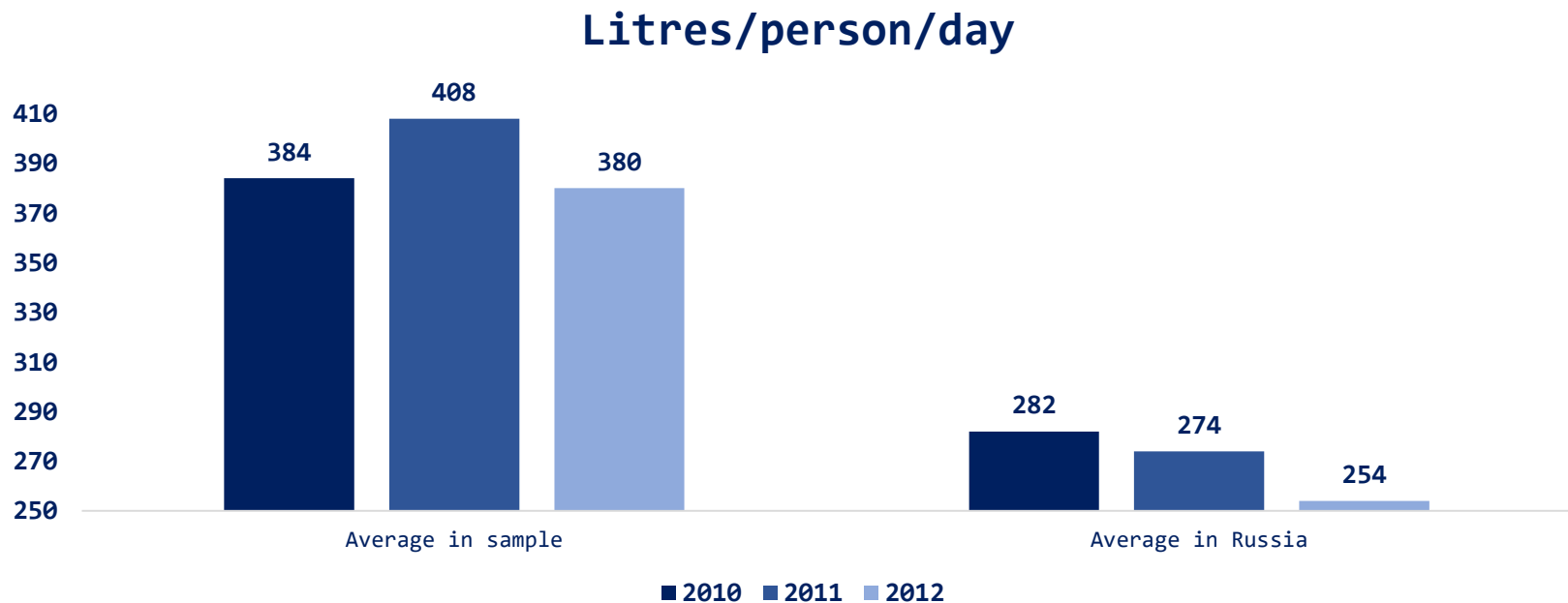
# International benchmarking: Operating expenses coverage ratio



According to the latest data, Russian companies are third after Australia and Korea in terms of covering operating expenses. This ratio remains stable during the entire period of observations.

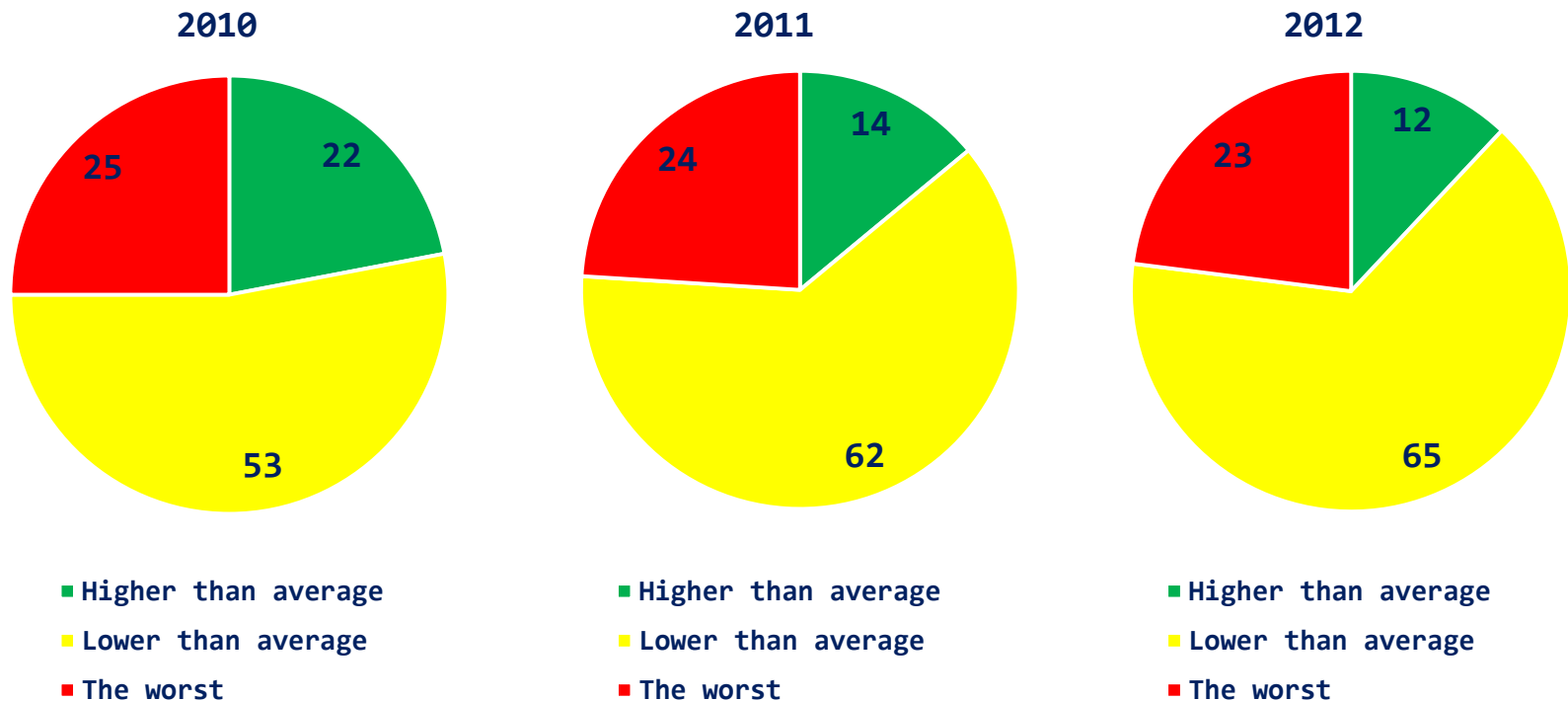
# International benchmarking: Average labour productivity

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The main issue associated with efficiency of Russian water companies is remarkably low labor productivity compared to the average in the sample. Moreover, it declines from year to year.

# International benchmarking: Labour productivity of Russian Companies



There is no Russian company that enters to the first quartile of the most productive companies in our sample. Russian companies mostly and increasingly tend to demonstrate average productivity.

# National benchmarking: Data

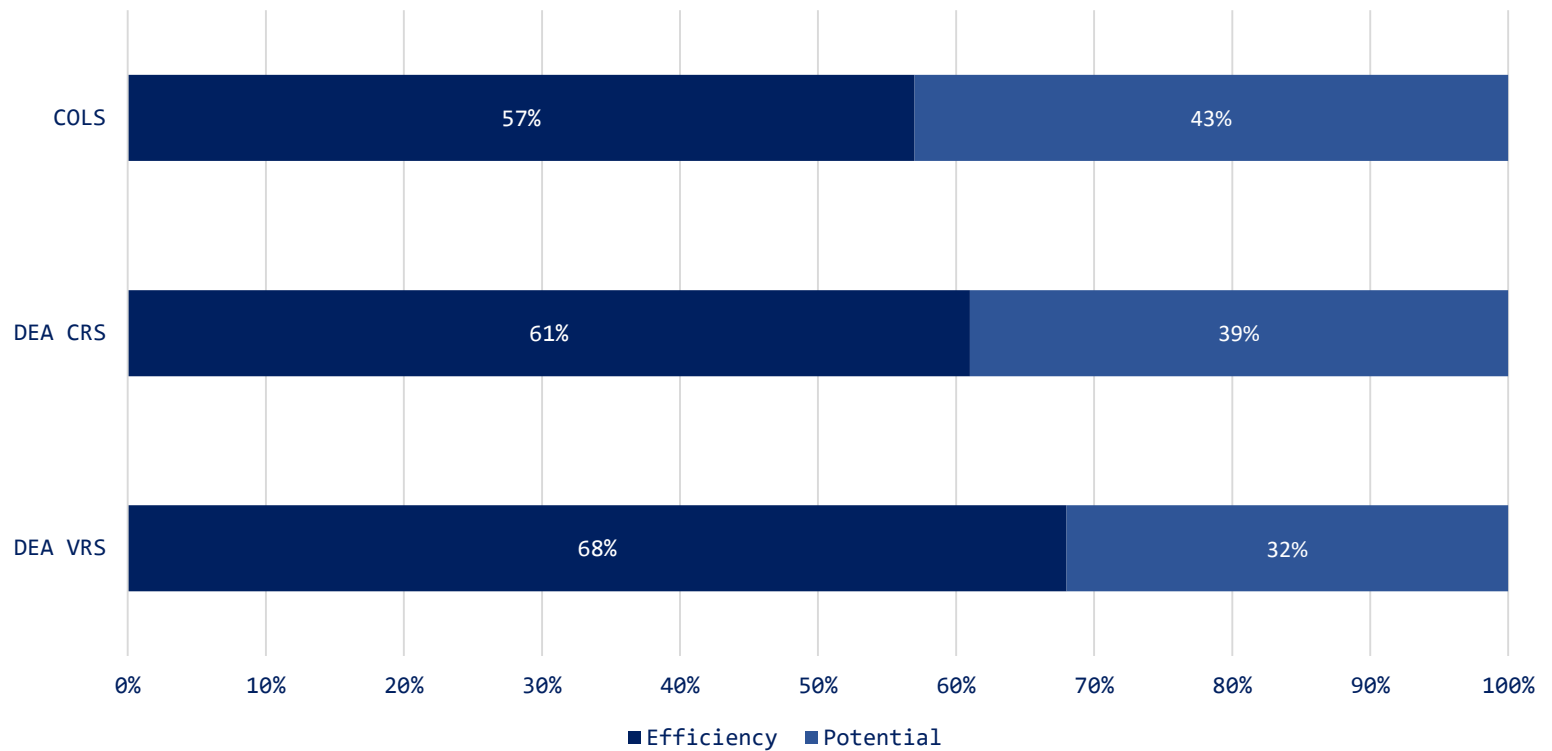
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<b>Variables</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>St.dev.</b>
Total cost, m rub.	12.4	14.78	13.53	0.59
Electricity consumption	3.03	5.13	4.2	0.59
Labor, pers.	4.47	7.54	6.1	0.67
Pipeline length, km	5.62	7.88	6.84	0.51
Pumping stations, units	1.1	5.48	3.53	0.96
Water delivered, thousand of cubic m	9.5	12.12	10.84	0.63

# National benchmarking: Key findings

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Average total costs efficiency of Russia's companies





# National benchmarking: Key findings

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- ✧ All models produce similar ranking results
- ✧ Models identify the following sources to improve the efficiency:
  - ✧ Labour productivity
  - ✧ Efficiency of investment costs
  - ✧ Energy efficiency

# Conclusions

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✦ Modern benchmarking techniques allow to derive reliable efficiency estimates which could be used to support decisions of regulators and company managers

# Conclusions

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- ✧ International benchmarking helps to better explain sources of inefficiency, prevents companies from gaming
- ✧ International cooperation of the BRIC countries could facilitate data collection and use of the most advanced methods of efficiency analysis

# International initiative

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The BRICS countries face similar challenges of creating and improving institutions, mechanisms and methodological foundations of the regulation and pricing of water supply and sanitation companies, improving their efficiency, ensuring sustainable development and environmental protection.

The search for solutions to these problems would require close international cooperation among

- ✧ Public authorities
- ✧ Business associations
- ✧ Universities and think tanks

# International initiative

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Possible activities could comprise

- ✧ joint research on regulatory issues, pricing, efficiency, problems of attracting investments into regulated companies in water supply and sanitation, new approaches, methods and tools for benchmarking and clusterization of regulated companies;
- ✧ dissemination of best regulatory management practices of water supply and sanitation companies, analysis on impact of different regulatory practices and environment, performance monitoring of regulated companies
- ✧ training and education in regulation, management and pricing of services in water supply and sanitation

Thank you for your attention!