TRANSFORMERS MAGAZINE'S
INDUSTRY NAVIGATOR

INVESTMENTS, ARTIFICIAL INTELLIGENCE AND SUSTAINABILITY

CONFERENCE 2024

Investments 2024 - Outlook to 2033

Dr. Mladen Banovic

13 June 2024

Biography

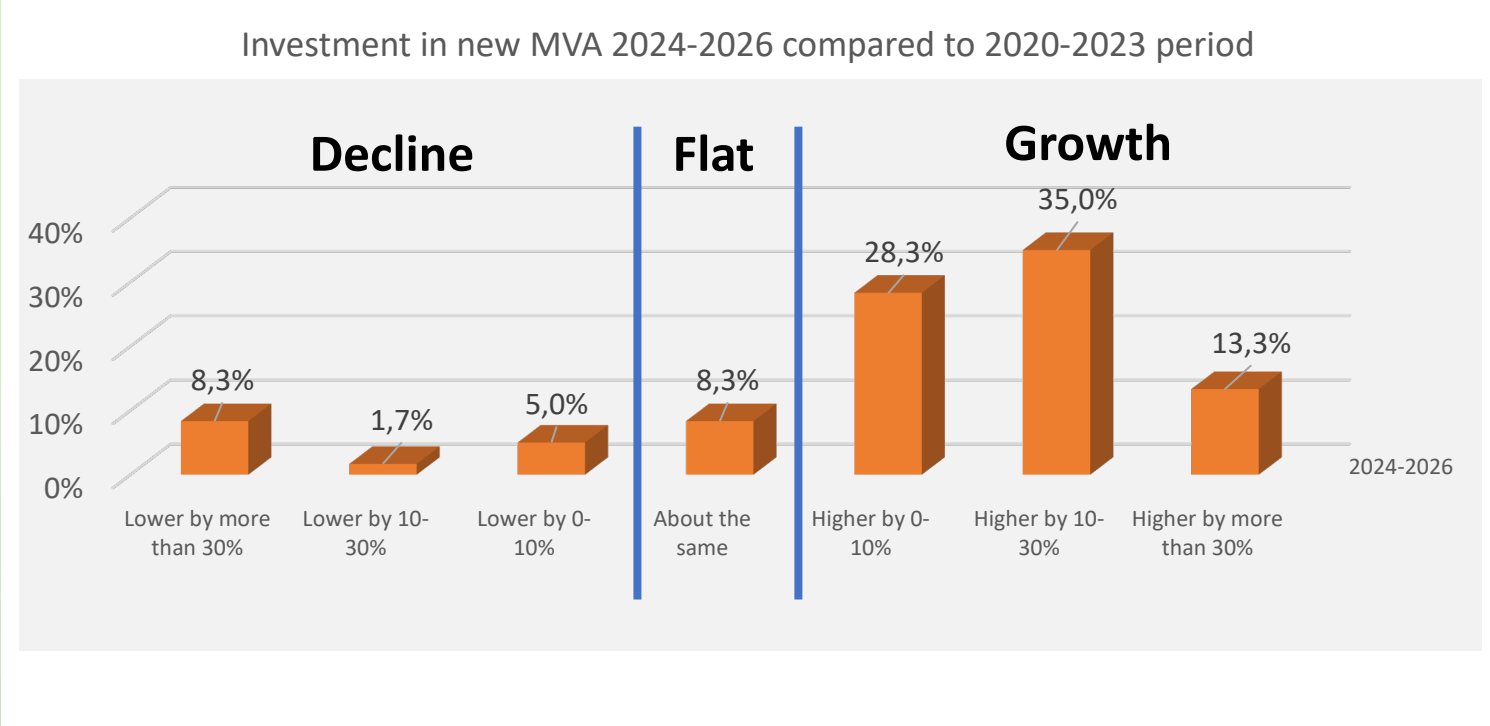
Mladen Banovic, PhD

- Scientist and innovator in the field of energy transmission with 25 years of technical and managerial experience.
- Current positions: Director and Editor-in-Chief at Merit Media Int.
- Portfolio: Transformers Magazine, Transformers Academy, Industry Navigator, Transformers Forum, and Switchgear Magazine.
- During his career, he managed the development of products and systems for worldwide use in electric power grids up to 1200 kV (currently the highest level in the world), the development and deployment of systems for smart grid and automated design, testing, diagnostic and monitoring systems.
- Education: PhD, MSc, and BSc degrees in electrical engineering from the University of Zagreb, Croatia.
- Affiliations: IEEE Senior Member, CIGRE, European Association of Science Editors (EASE), etc.

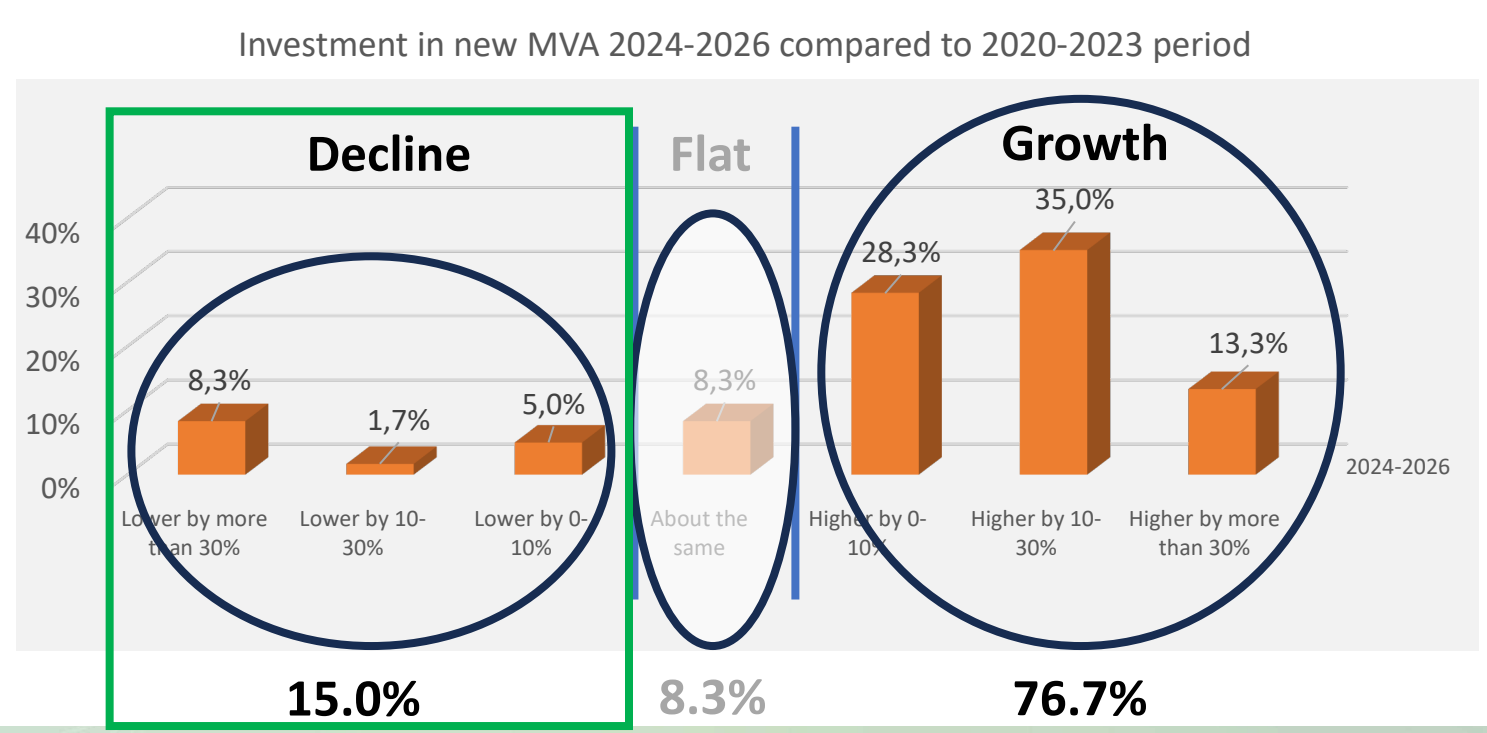
Research on Investments

- The objective of the research: to cover the entire value chain: transformers, materials and components, manufacturing, operations, etc., and provide answers to key questions (57) on investments, supply chain challenges, sustainability, etc.
- Carefully designed to provide scientific analyses including comparison to previous reports.
- The research and report cover the following areas:
  - **Investments in new transformers in the grids** (6 questions)
  - **Lead time** for new transformers (6 questions)
  - Key **supply chain challenges** (14 questions)
  - **Investments in manufacturing capacities** (9 questions)
  - **Sustainability** (8 questions)
  - **Future trends** (9 questions)
  - Business outlook (5 questions)

Investments in new transformers in the grids



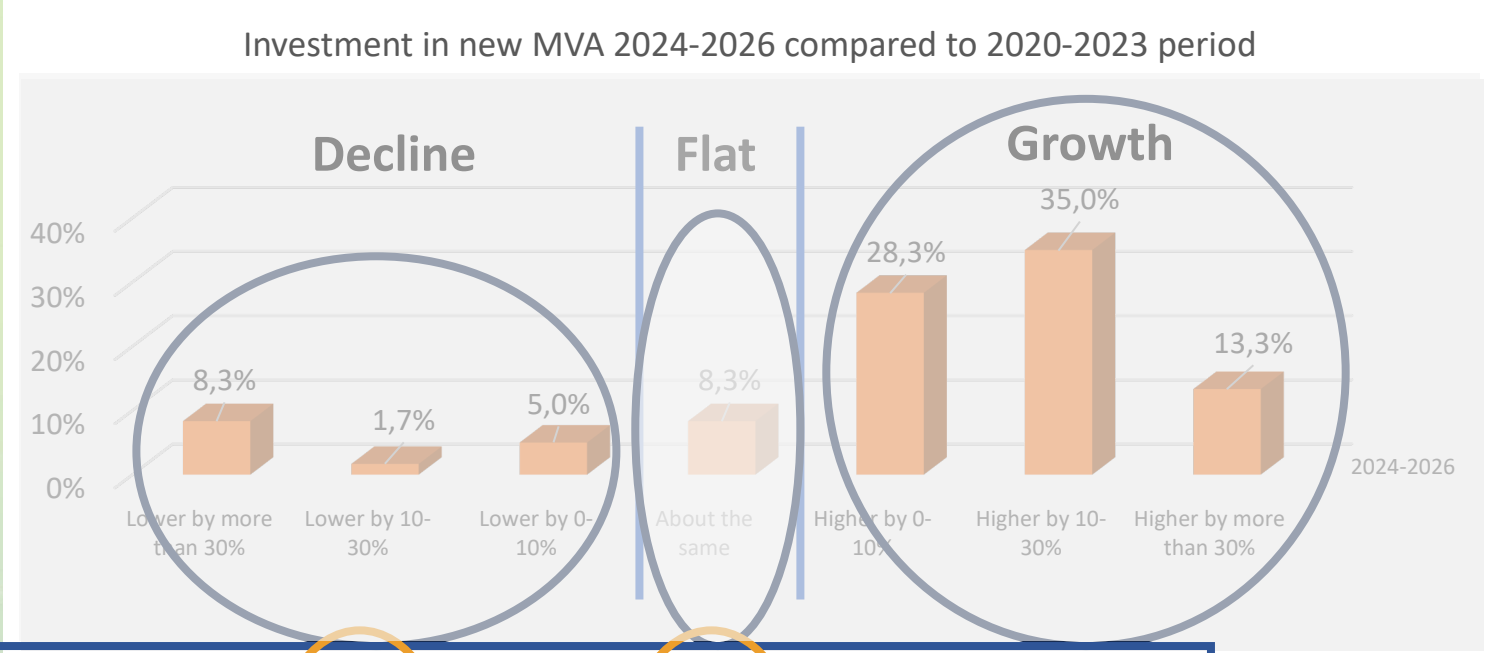
Investments in new transformers in the grids



Decrease in MVA:

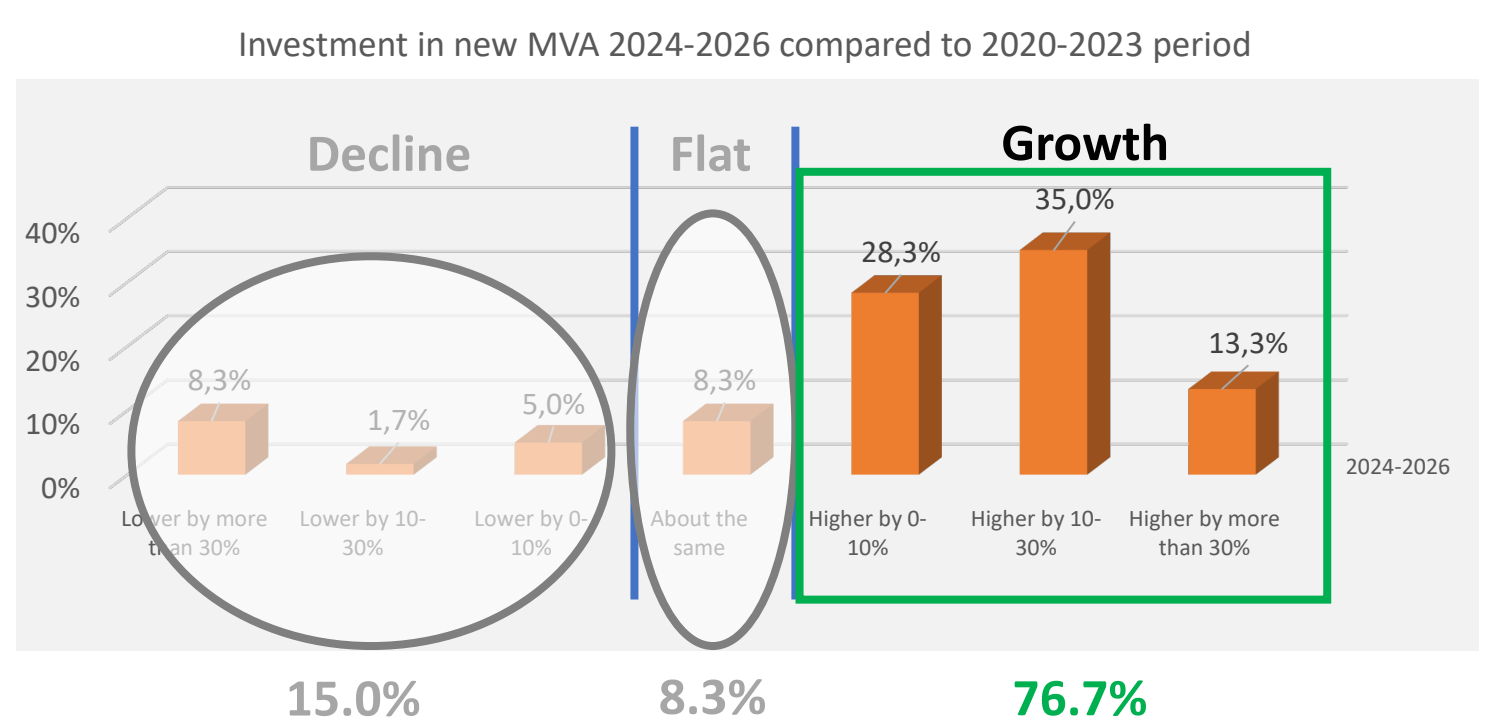
- Negative business results for utilities
- Price increase (less MVA for the same money)
- Instability (wars, pandemics)
- Financial crises
- **Availability of people**

Investments in new transformers in the grids

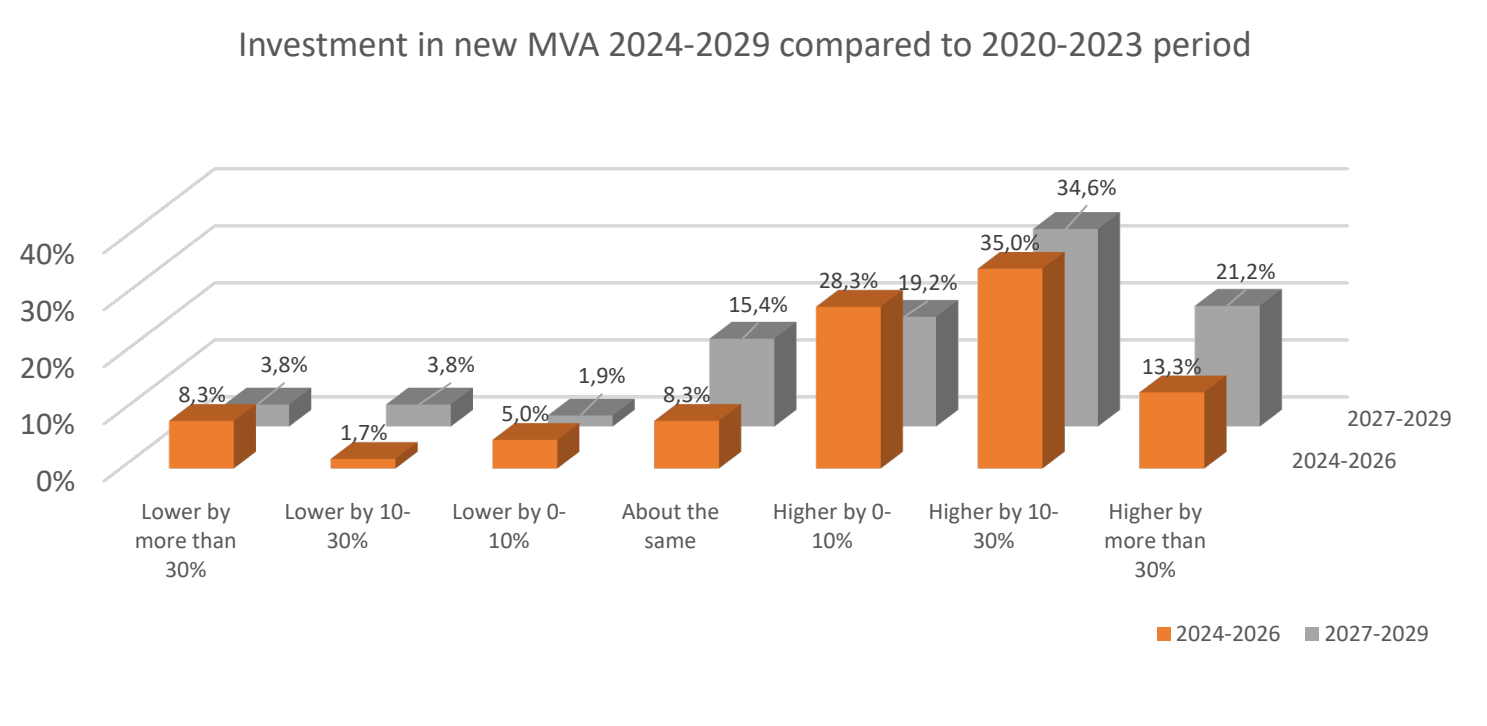


MVA:	**15.0%**	**8.3%**	**76.7%**
Number of transformers:	8.1%	16.1%	75.8%

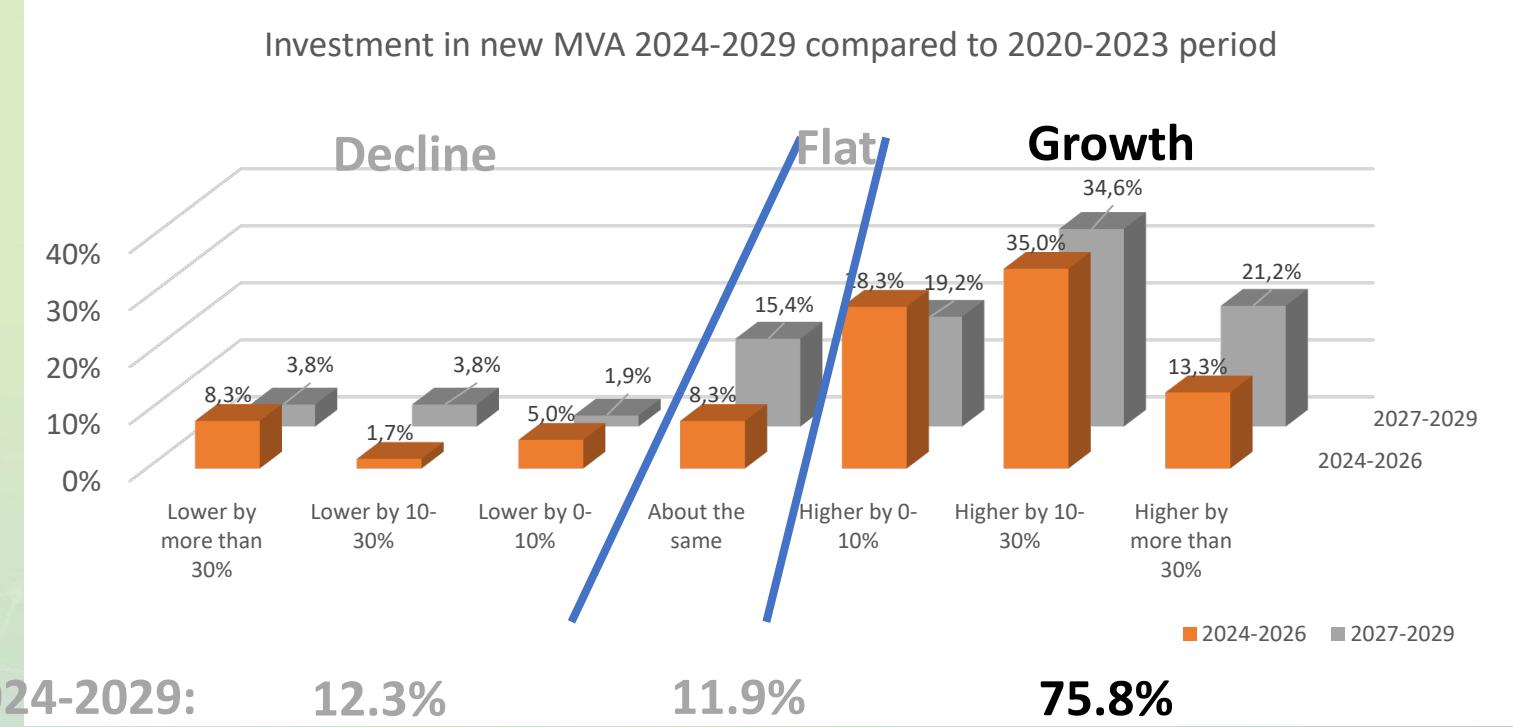
Investments in new transformers in the grids



Investments in new transformers in the grids

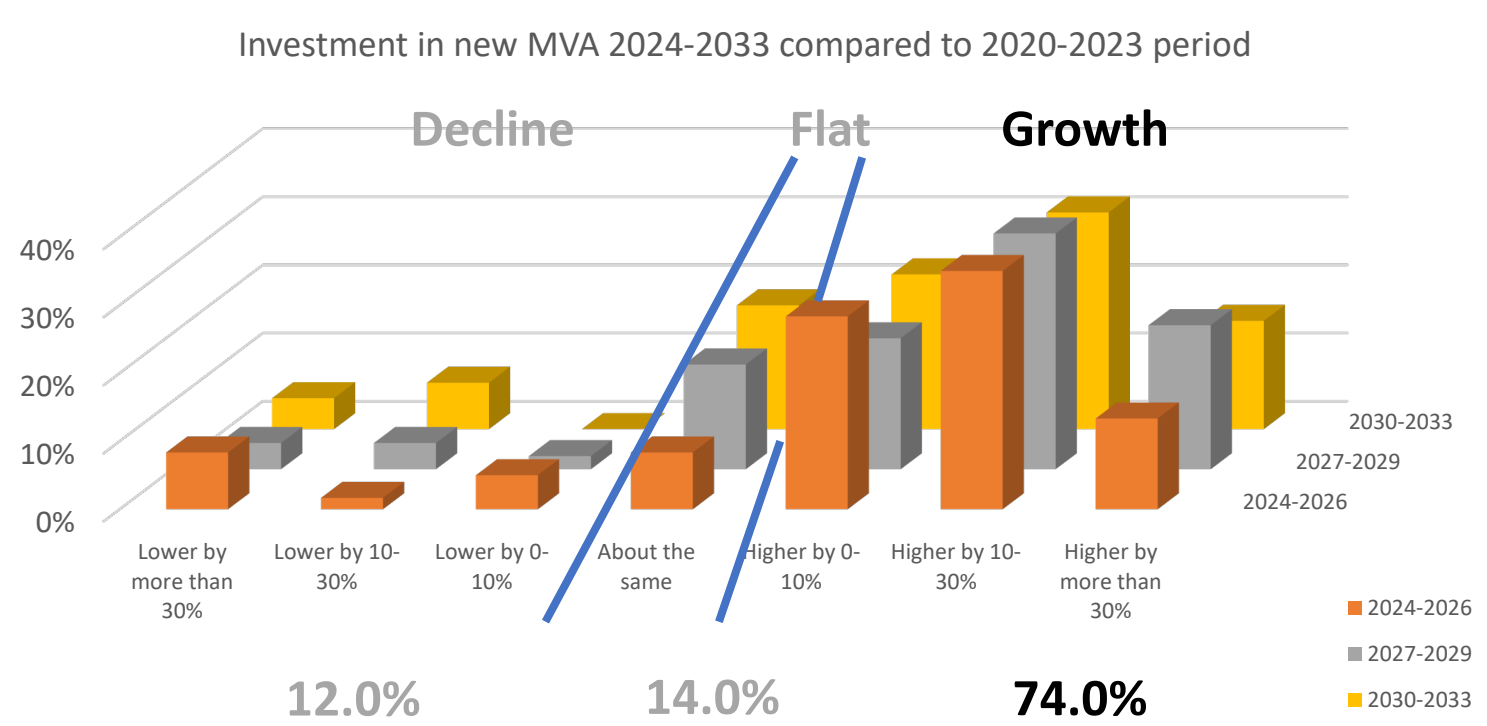


Investments in new transformers in the grids



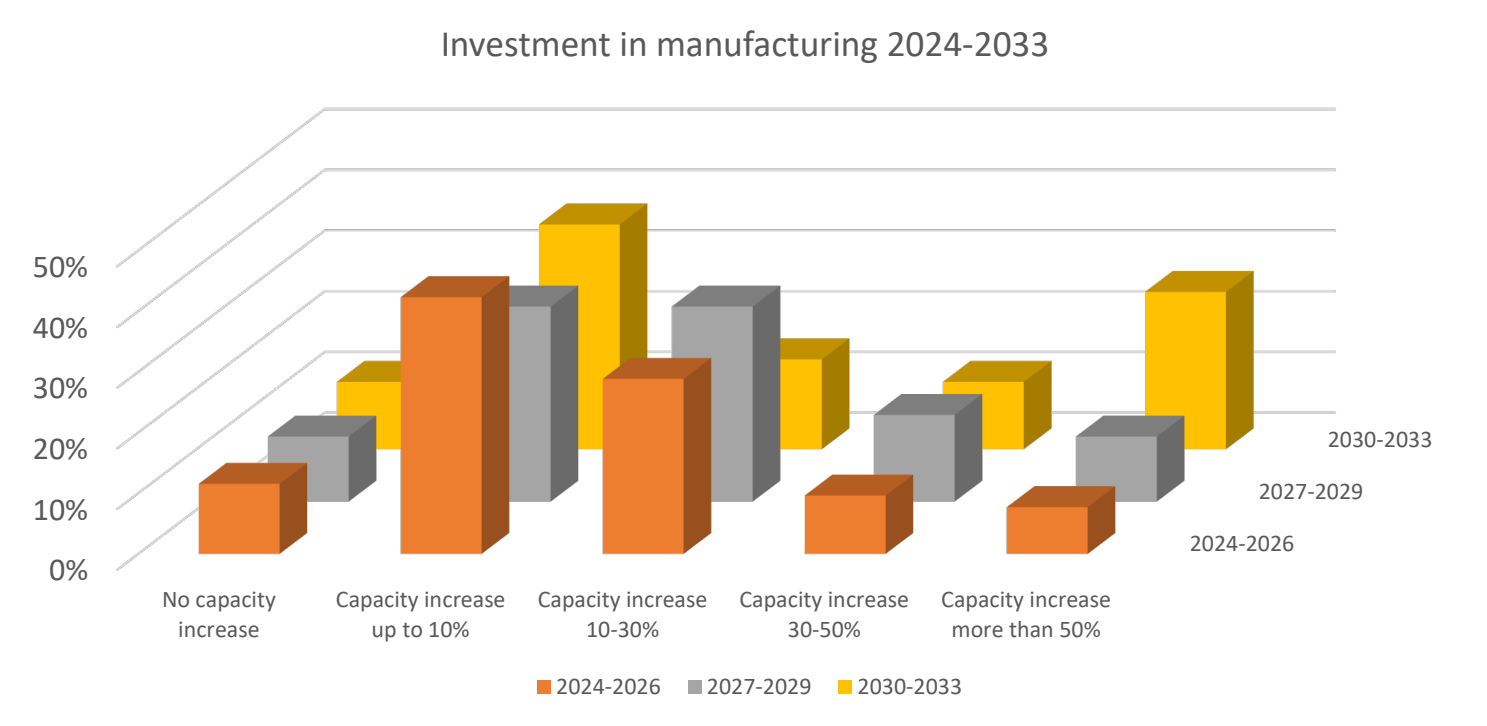
2024-2029:	12.3%	11.9%	**75.8%**
2024-2026:	15.0%	8.3%	**76.7%**

Investments in new transformers in grids



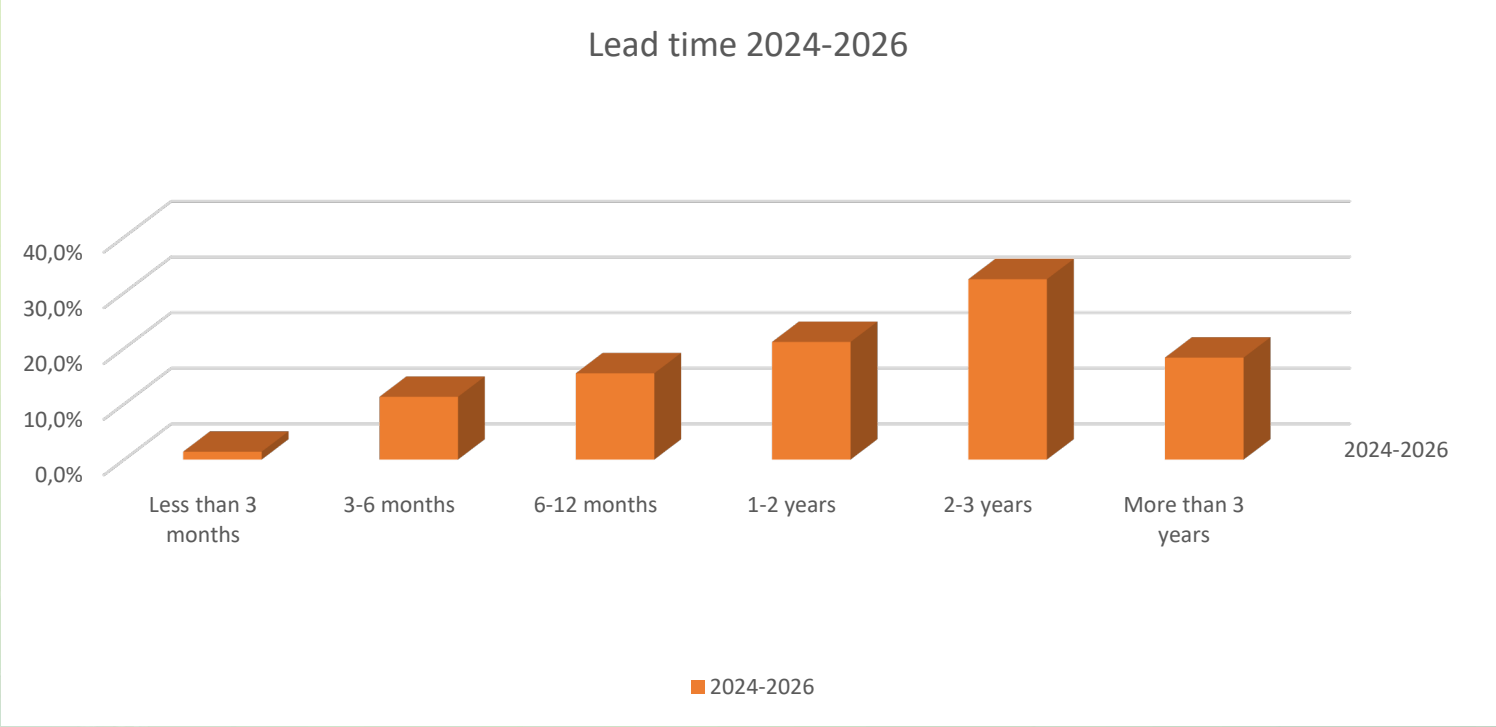
- Solid market growth until 2033 (3/4 of the market will grow)
- Consideration of declining markets
- No significant difference in dynamics for the number of units and total MVA

Investments in manufacturing capacity



Investments will continue throughout the research period (until 2023)

Lead time


Lead time 2024-2026
40,0%
30,0%
20,0%
10,0%
0,0%
Less than 3 months
3-6 months
6-12 months
1-2 years
2-3 years
More than 3 years
2024-2026
2024-2026

Lead time


Lead time 2024-2029
35,0%
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
Less than 3 months
3-6 months
6-12 months
1-2 years
2-3 years
More than 3 years
2027-2029
2024-2026
2024-2026
2027-2029

Lead time

With anticipated investments in manufacturing capacities, the lead time is expected to improve (significantly) from 2027 onwards.

People

Q33: What are the most significant constraints to increase manufacturing capacity (whether for transformers, materials, or components)?

	Score	Rank
Availability of finance	3.49	3
Availability of staff	4.16	1
Availability of raw materials	3.15	5
Reluctance of management/owners to increase manufacturing capacity	3.52	2
Long lead times for new equipment and/or construction works	3.39	4
Limited test station capacity	2.57	7
Anticipated market demand and growth	2.95	6

People

Q34: Does your company have available capacity that is not being used due to lack of labour?

	Pct.	Rank
No	54.7%	1
Yes, throughout production	9.4%	4
Yes, in bottleneck processes	15.1%	3
Yes, but minimal overall impact on capacity	20.8%	2

45%

Energy transition will be driven by the availability of talent

Key supply chain challenges

- The need for more capacity in the grid has the greatest impact on new transformer requirements.
- Availability of raw materials and components is the most significant problem in procuring new transformers, materials, and components.
- **Nearly 90% of respondents** reported that recent market changes had led them to **place orders one or more years earlier than before** (even up to 5 years earlier).
- Around **two thirds of respondents** (64.2%) **significantly increased key components inventory** (10% increased inventories by more than 50%).
- **Conclusions about market trends based on current order trends can be very misleading**.
- The most significant risk in transformer manufacturing is related to the availability of core steel.
- Rising raw material costs have had the biggest impact on price increases for products/services over the past 3 years.
- Quality and speed of delivery will have the highest importance for transformer procurement decisions.

Key supply chain challenges

- **Conclusions about market trends based on current order trends can be very misleading.**

Sustainability

- Reduced losses is what respondents most associate with a green or more sustainable transformer.
- The most likely future weighting of sustainability requirements in the evaluation of transformer bids in tenders in 2030 is 10-30%.

Future trends

- Improvement of sustainability and focus on maintenance and reliability will be two of the most important options related to procuring new transformers.

- Reliability will be the top priority for innovations over the next 5 years.

Conclusions:

- Investments in transformers in grids
  - Solid market growth expected until 2033
  - Consideration of **declining markets**
  - No significant difference in dynamics for the number of units and total MVA

- Investments in manufacturing capacity will continue throughout the research period (until 2023)

- Lead time: with anticipated investments in manufacturing capacities, the lead time is expected to improve (significantly) from 2027 onwards

- **Conclusions about market trends based on current order trends can be very misleading**.

- **People: energy transition will be driven by the availability of talent**

- Experience of working with macro trends (years) enables us to **now focus on micro (monthly) trends**