CHALLENGES OF THE HUNGARIAN AUTOMOTIVE INDUSTRY

2nd Visegrad conference

Institute of World Economics, Centre for Economic and Regional Studies

7th and 8th of June, 2022

Association of the Hungarian Automotive Industry - MAGE
Csaba Kilián - CEO

Mission of MAGE Association

- Effective representation in legal, economic and social issues
- Improve competitiveness
- Promote national suppliers
- Support strong and productive R&D&I
- Foster further automotive investments
- Enhancing international partnership

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MAGYAR GÉPJÁRMŰIPARI EGYESÜLET

MAGE MEMBERS

1. AGC Glass Hungary Kft.
2. Allison Transmission Hungary Kft.
3. Apollo Tyres Hungary Kft.
4. Aptiv Connection Systems Hungary Kft.
5. Arconic-Köfém Kft.
6. AUDI Hungaria Zrt.
7. Autoliv Kft.
8. Bálind Kft.
9. BPW Hungária Kft.
10. Bridgestone Tatabánya Termelő Kft.
11. Continental Hungária Kft.
12. Dana Hungary Gyártó Kft.
13. Deloitte Zrt.
14. Denso Gyártó Magyarország Kft.
15. ElringKlinger Hungary Kft.
16. Emerson Automation FCP Kft.
17. Federal Mogul Hungary Kft.
18. Flextronics International Kft.
19. F. Segura Hungary Kft.

MAGE MEMBERS

20. Gedia Hungary Kft.
21. Hajdu Autotechnika Ipari Zrt.
22. Hanon Systems Hungary Kft. (Alba Plant)
23. Harman Becker Gépkocsirendszer Gyártó Kft.
24. HRT Spedition Kft.
25. HUNGEXPO Vásár és Reklám Zrt.
26. Hydro Extrusion Hungary Kft. (SAPA)
27. Joyson Safety Systems Hungary Kft.
28. KIRCHHOFF Hungária Kft.
29. KNORR-BREMSE Fékrendszerek Kft.
30. Le Bélier Kft.
31. Magyar Gépjárműimportőrök Egyesülete (MGE)
32. Magyarmet Finomöntöde Kft.
33. Magyar Suzuki Zrt.
34. Mercedes-Benz Manufacturing Hungary Kft.
35. MKB Bank Zrt.
36. NEFAB Packaging Hungary Kft.
37. Nemak Győr Alumíniumöntöde Kft.
38. NI Hungary Kft.
39. NOERR és Társai Iroda
40. Opel Szentgotthárd Kft.
41. Pannonjob Humán Szolgáltató és Tanácsadó Kft.

MAGE MEMBERS

42. PEMÜ-Műanyagipari Zrt.
43. Provertha Electronic Components Ipari Szolgáltató és Kereskedelmi Zrt.
44. PwC Magyarország Kft.
45. RÁBA Járműipari Holding Nyrt.
46. Rehau-Automotive Kft.
47. Rigó Kft.
48. Robert Bosch Kft.
49. Salgglas Üvegipari Zrt.
50. Schaeffler Savaria Kft.
51. Schwarzmüller Járműgyártó és Kereskedelmi Kft.
52. Shinwa Magyarország Precíziós Kft.
53. Siemens Zrt.
54. Simon Plastics Kft.
55. Sisecam Automotive Hungary Kft.
56. SMR Automotive Mirror Technology Hungary Bt.
57. Starters E-Components Generators Automotive Hungary Kft. (SEGA)
58. thyssenkrupp Materials Hungary Zrt.
59. thyssenkrupp Components Technology Hungary Kft.
60. Titán’94 Kft.
61. Tom-Ferr Zrt.
62. ZF Hungária Kft.
63. 4iG Nyrt.

The vehicle industry of Hungary

In addition to a 20 % contribution to the national export this branch of the processing industry provides working possibilities for several small and medium enterprises, suppliers.

The major part of the Hungarian automotive industry is concentrated in Győr-Esztergom, Szentgotthárd-Szombathely, Debrecen, Kecskemét and Miskolc regions.

More than 50 from the 100 biggest suppliers of the vehicle industry are present in Hungary

Number of enterprises close to

900

Number of employed people:

175 000

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Impact of the COVID crisis on the automotive industry, at financial, operational and strategic levels

Source: Top Tier Consultants

Panorama of domestic vehicle production

OEM-s, Tier1-s

- foreign property,
- high technology level,
- significant resources,
- high production value,
- mostly high foreign material content,
- export orientation,
- typically foreign R & D, but expanding tasks.

SMEs

- traditional capacities,
- scattered inadequate resources,
- low added value,
- low cooperative level,
- typically no R & D,
- increasing number of exceptions.

The output of small businesses fell the most

Production of organizations with 5-49 people decreased by 16% compared to a year earlier. The largest industry in this circle metallurgy and metal processing, as well as rubber, plastics and plastics the performance of the building materials industry lagged behind from the year 2019. Medium, 50 to 249 people and enterprises with a larger number of employees production volume to a lesser extent, 6.8, and decreased by 4.3%.

The output of large export-oriented large enterprises is mainly due to the decline in vehicle production became smaller, this was partially compensated by that among the industries expanding during the pandemic also the manufacture of electrical equipment, the manufacture of pharmaceuticals and the manufacture of electronics it focuses on large corporations.

Enterprises with at least 250 employees in 2020 nearly three-quarters of industrial production was produced, and industrial exports even more so most of it was given.

Distribution of industrial production and sales by company size, 2020,%, Source: KSH

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Electronics industry in Hungary

22.9% share of total manufacturing output

7.7 billion Euro FDI stock in the sector

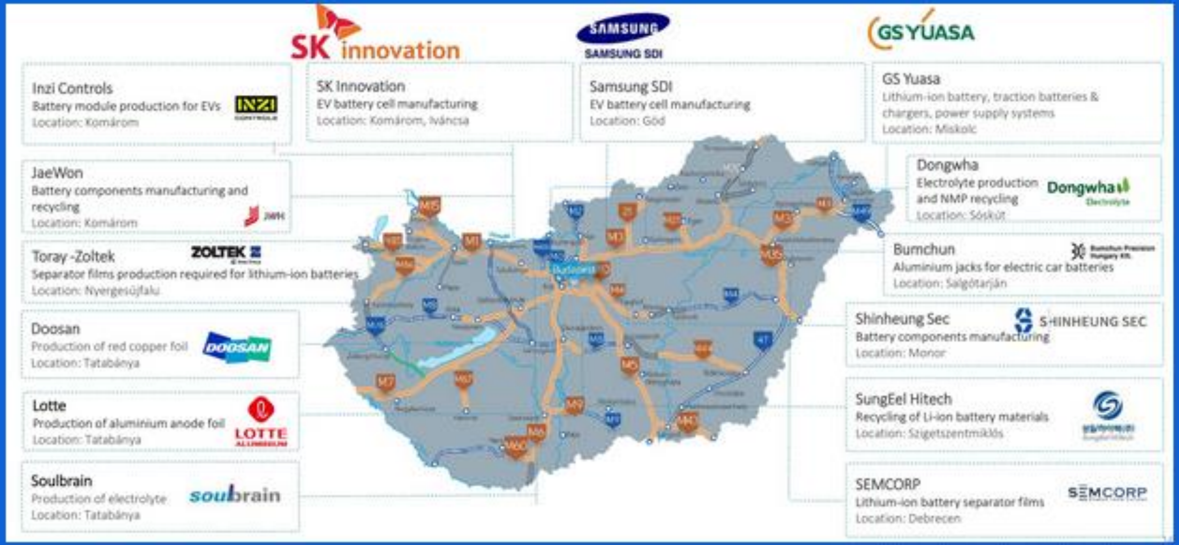
Production value of 21.3 billion Euros

92.8% export share in the sector

30.4% share of total exports

Battery industry in Hungary

150 GW / h battery cell production capacity by 2025
6.2 billion Euro FDI in the last 3 years



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Innovation hubs in the automotive industry

Audi
Engine development (CNG engine), humanoid robot hands
Location: Győr

IBIDEN
Design and manufacturing Diesel Particle Filters for vehicle exhaust gas and Sealing Materials for catalytic converters
Location: Dunavarsány

Thyssenkrupp
Electronic and autonomous steering systems (e.g. cross-wind compensation, lane keeping assist, parking assistance), autonomous driving
Location: Budapest, Veszprém

Bosch
Expanding autonomous driving and e-mobility related projects with more than 2,700 R&D personnel
Location: Budapest, Miskolc

Continental
Product development of capital equipment, Advanced Driver Assistance Systems (ADAS)
Location: Budapest, Veszprém

Valeo
Product development of electronic control and camera control units, driving assistance systems
Location: Veszprém

Balluff
A new research and development project, targeting the major regeneration of sensors and network devices for industrial automation. Location: Veszprém

TDK
Smart-car parts development (e.g.keyless entry, ignition system, optical parking assist systems)
Location: Szombathely

ZalaZone
Indepentent proving ground for autonomous, connected, electric and conventional cars besides other vehicles
Location: Zalaegerszeg

Evosoft
R&D of electric propulsion control systems at expert level with the background of SIEMENS AG
Location:Budapest

National Instruments
Cutting edge measurement and autonomous driving
Location: Debrecen

AVL
Powertrains, measuring tools and software development, ADAS testing
Location: Budapest, Kecskemét, Zalaegerszeg

Knorr-Bremse
Mechanical components and electrical systems and components, pneumatic brake systems, SW component, I-Com Assist (Drives Advisory System
Location: Budapest, Kecskemét

NNG
Development of various navigation and software for the automotive industry
Location: Budapest, Szeged

Source: HIPA

R&D Sector in Hungary

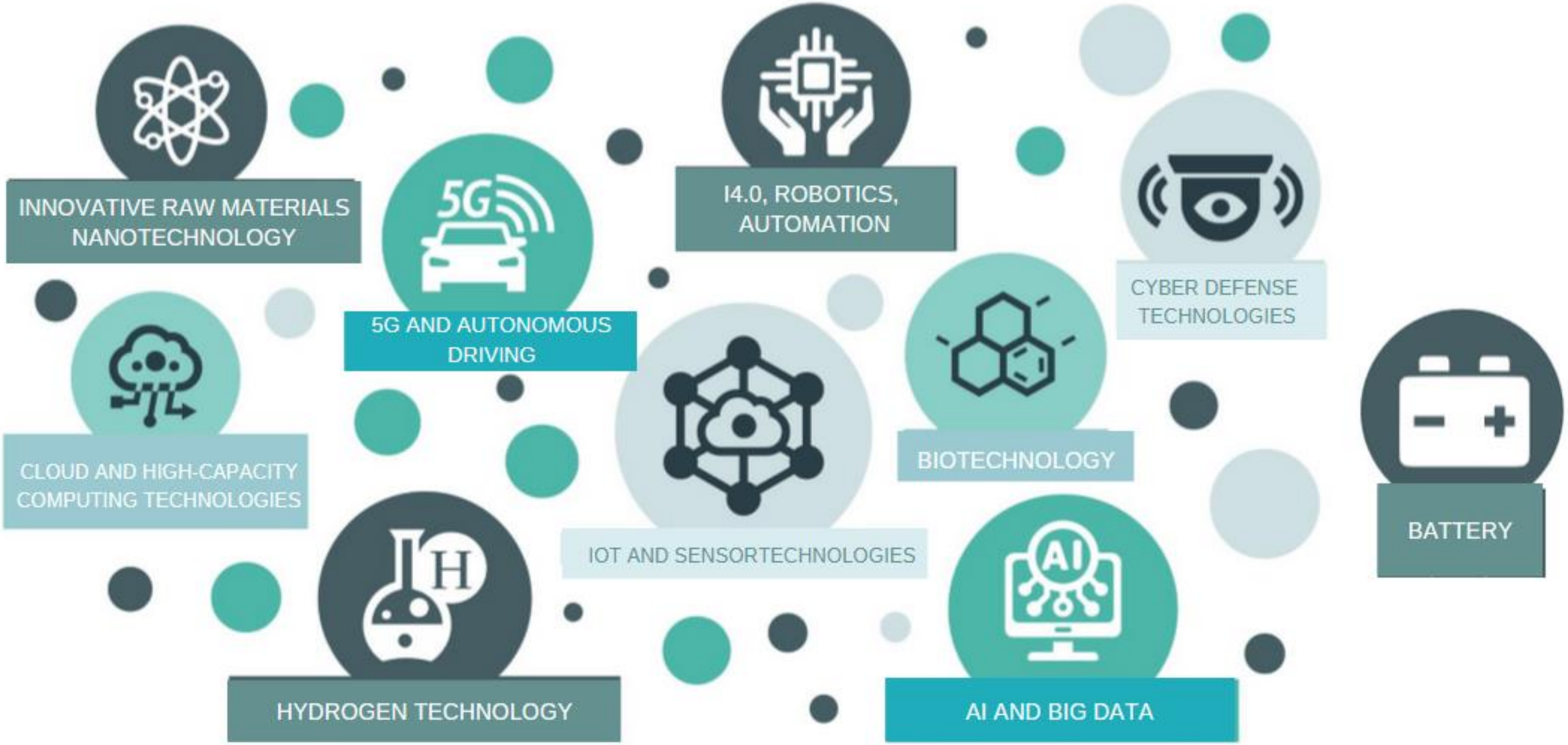
- Rich portfolio of R&D grants
- High level of scientific research, significant results in the areas of physics, mathematics, biology, chemistry, clinical medicine and engineering
- Established knowledge centres and increasing economic role of networking
- Long-standing tradition of innovation, open economy and proliferation of incubator services
- Smart specialisation supported by funding system

R&D Sector in Hungary

- Supportive legal and taxation environment
- Market compatible education: successful cooperation of companies and educational institutes
- Institutions and framework conditions are rapidly developing and partaking in world-class projects
- Closer cooperation between academia and the business sector
- Increasing economic role of networking, cooperation, and innovation

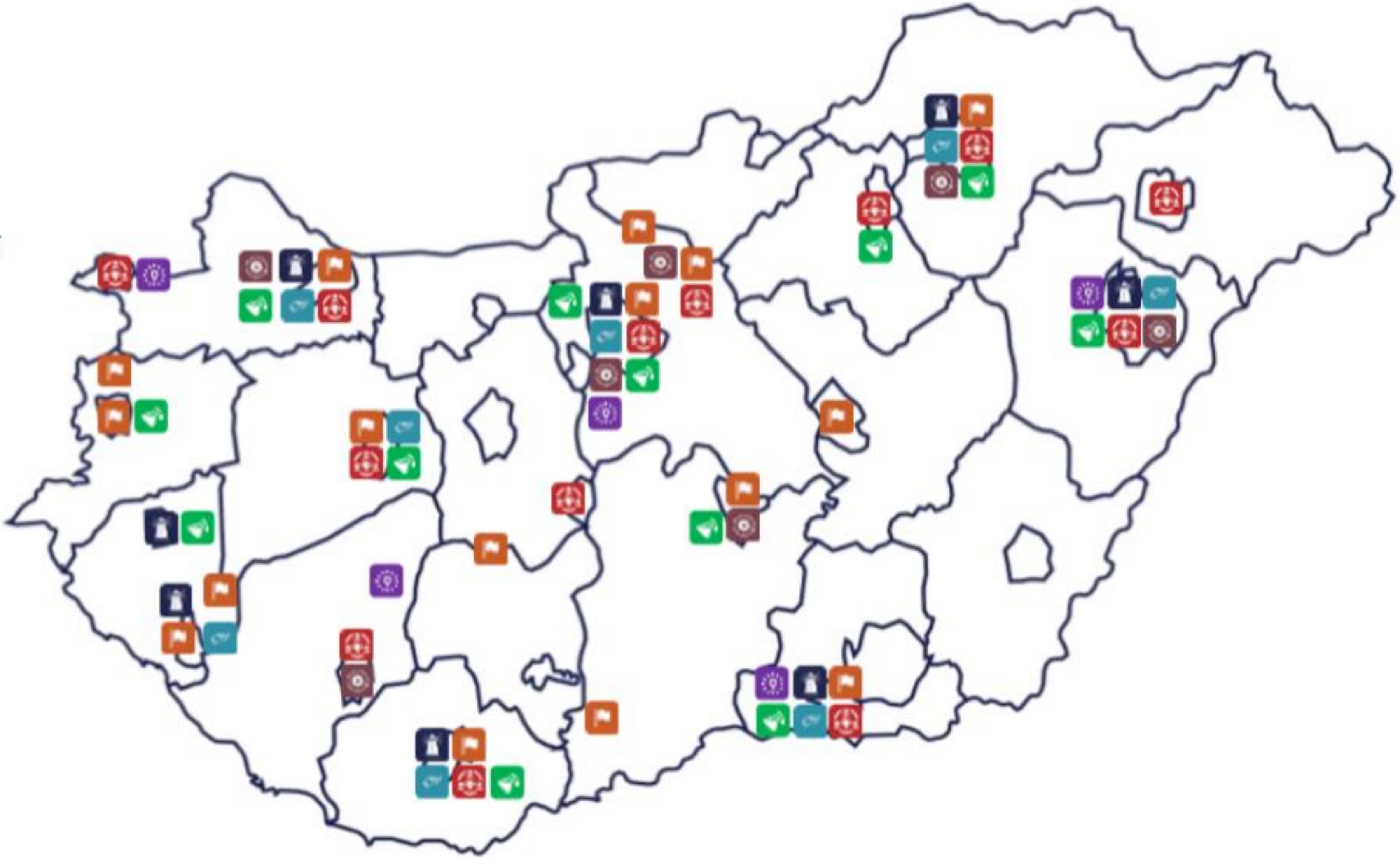
clusters

Technological directions - the key technologies of the future

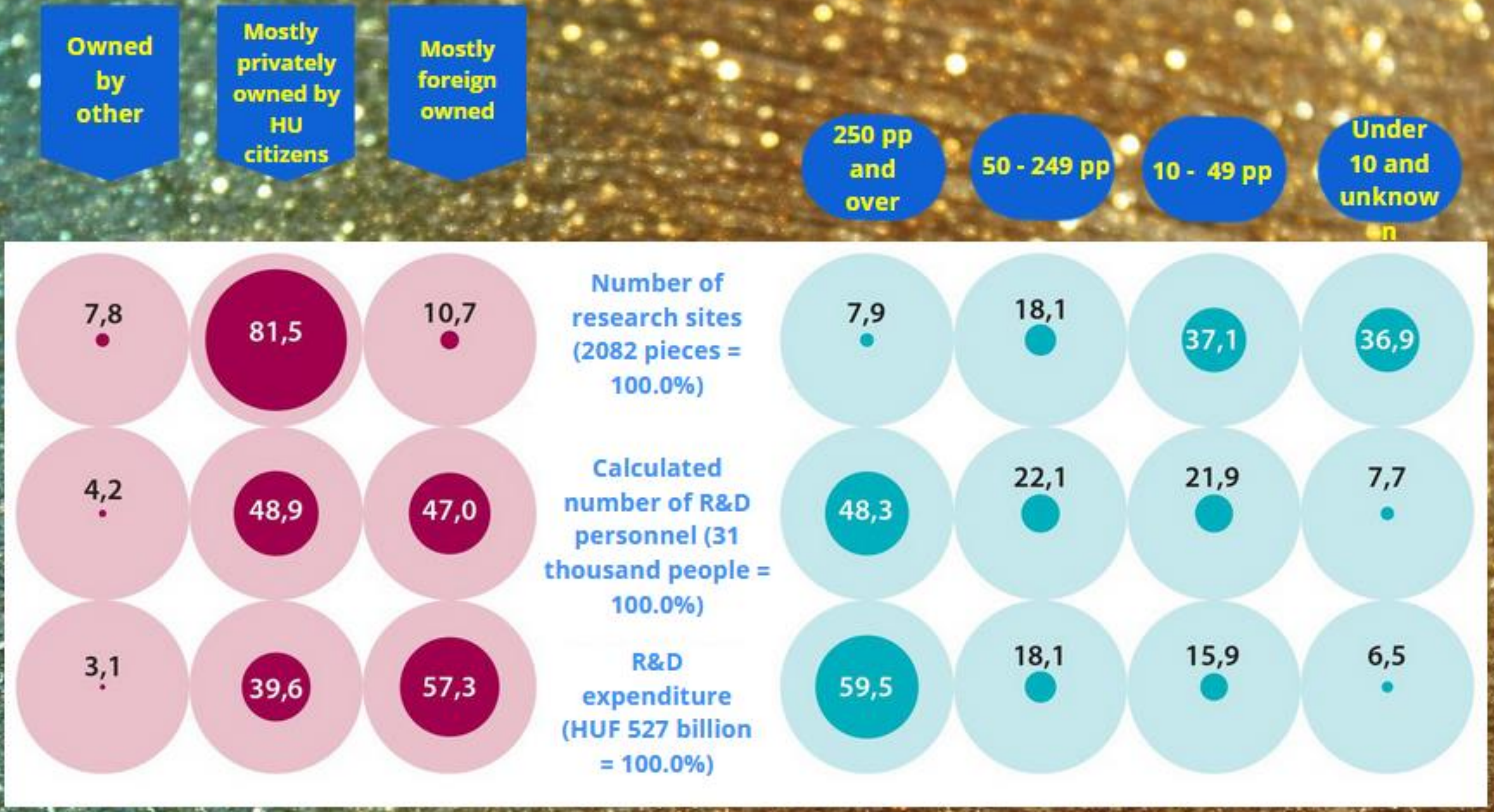


Institutional elements of the Hungarian innovation ecosystem

- Center for Industrial Cooperation in Higher Education
- Competence center
- University innovation ecosystem
- National laboratory
- Science and innovation park
- Bay Zoltán Nonprofit Ltd.
- Eötvös Lóránd research network



Large, mostly foreign-owned companies spend the most on R&D



Distribution of the main indicators of enterprises engaged in research and development by type of ownership and headcount category, 2019,%.

Source: KSH

Hungary in artificial intelligence research

- Master's degree in English at several universities
- Establishment of an artificial intelligence platform
- Industrial - academic, university collaborations
- Investments of foreign companies - Establishment of an AI research center

e.g. Continental, Bosch, Siemens, Valeo, Audi etc.

AImotive is the most-funded automated driving software supplier in Europe

It has offices on three continents: Hungary, the Americas and Japan.

3 main development areas:

- Aidrive platform-independent modular software package (system navigates with sensors, responds to changed environment with automatic image processing and artificial intelligence algorithm)
- Aisim with virtual simulation environment
- Aiware is an artificial intelligence accelerator (processor and chip speed, capacity and power consumption are the main challenges)

Hungary is on the map of Autonomous Driving

- Continental has opened a hardware and software R&D center (Deep Machine Learning Competence Center);
- ThyssenKrupp has developed intelligent steering systems for autonomous driving;
- Knorr-Bremse has built an autonomous semitrailer rig;
- Bosch developed equipment for self-driving cars, including accumulator sensors and voltage controllers for reducing fuel consumption of vehicles;
- Jaguar Land Rover opened a 100 people technical engineering centre in Budapest;
- Vodafone developed an online parking system for underground garages;
- Nokia Bell Labs is the innovation center in Hungary.

Thank you for your attention!

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