



INDUSTRIJSKI EKO PARKOVI

IZV. PROF. DR. SC. JELENA LONČAR

INDUSTRIJSKA GEOGRAFIJA

12. PREDAVANJE



CILJ PREDAVANJA:

- USVOJITI ZNANJA O POJMOVIMA I ZNAČENJU ODN. DJELOVANJU INDUSTRIJSKE SIMBIOZE, INDUSTRIJSKIH EKO-SUSTAVA, EKO-INDUSTRIJSKIH PARKOVA TE “ZELENIM” INDUSTRIJAMA.
- KROZ KONKRETNE PRIMJERE POKAZATI FUNKCIONIRANJE SVEGA GORE NAVEDENOG.

INDUSTRIJSKI EKOSISTEMI: RAZVOJ ODRŽIVIH INDUSTRIJSKIH STRUKTURA

Tradicionalni industrijski sistem proizvodnje



Extract and dump ind. sustav



Industrijska ekologija



Cilj industrijske ekologije > poticanje i razvoj dogovora unutar tvrtki koji bi podržavali materijale i energiju koji kruže kao kroz prirodni ekosistem, u kojem nema ni dodavanja niti dodatnog gubljenja tvari, već one konstantno kruže u prirodi.





Industrijska simbioza

Industrijski ekosistem:

smanjenje upotrebe netaknutih materijala
kao inputa

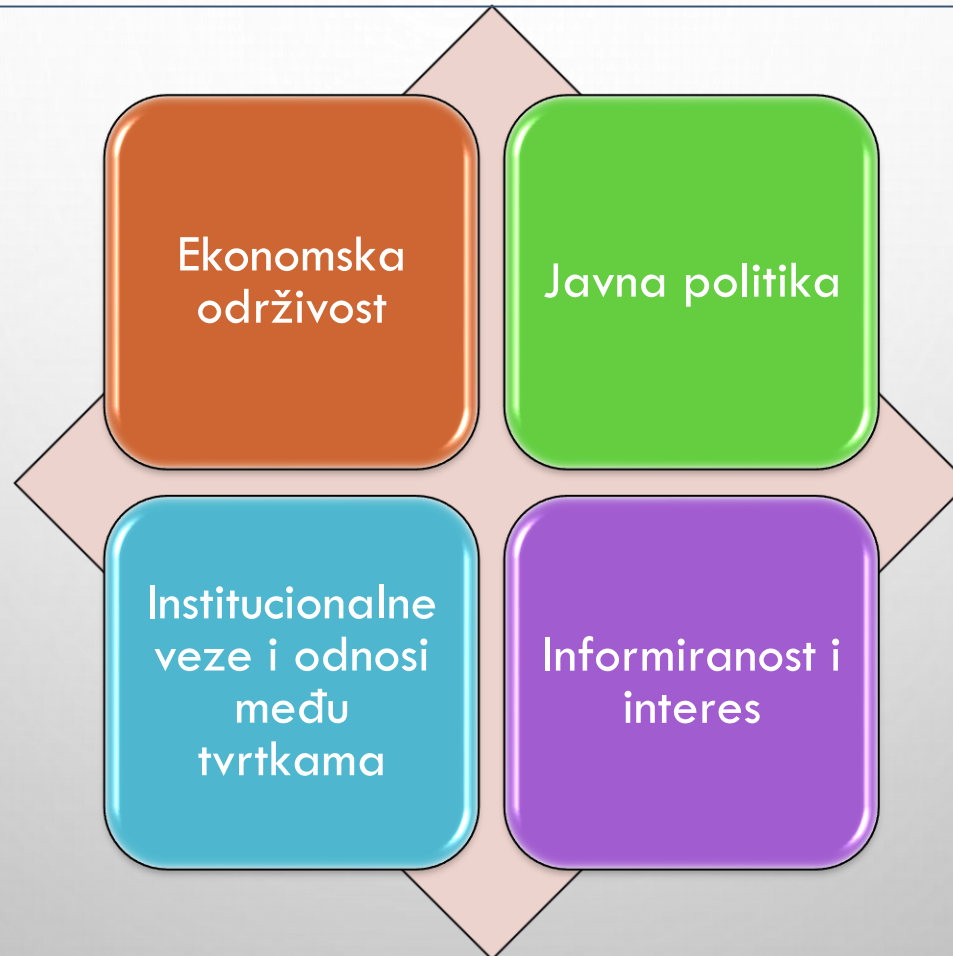
- smanjenje zagađenja;

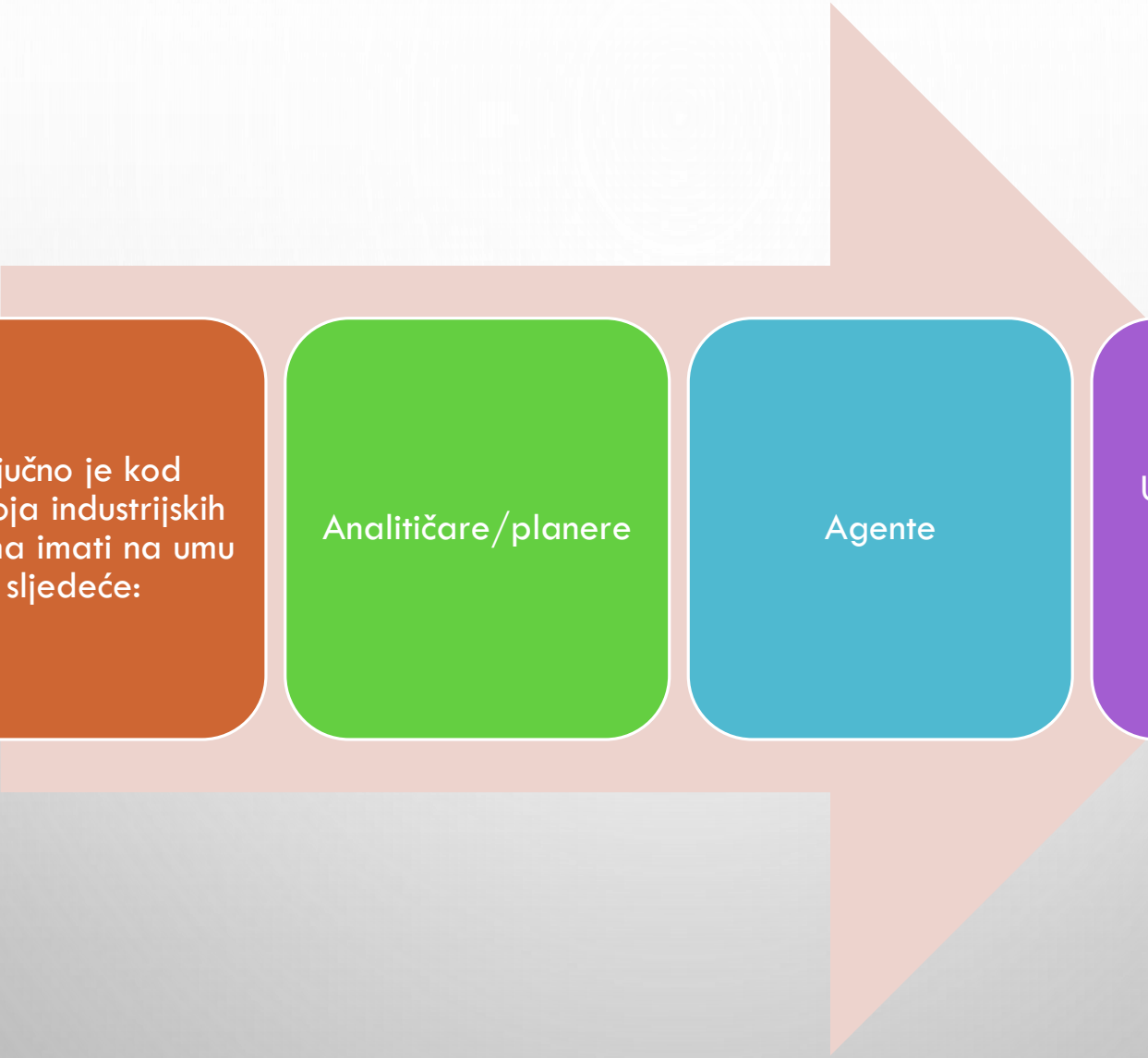
- povećanje iskoristivosti energije što dovodi
do njenog smanjenog korištenja

RAZVOJ INDUSTRIJSKIH EKOSUSTAVA

- INDUSTRIJSKA SIMBIOZA ZAHTIJEVA SVIJEST I KOORDINACIJU IZMEĐU INDUSTRIJA KOJA ZAHTIJEVA ŠIROKU BAZU INFORMACIJA:
- SISTEM GRANICA I TKO JE „UNUTRA“
- TOKOVI MATERIJALA I ENERGIJE
- KOLIČINA I VREMENSKA DISTRIBUCIJA
- KVALITETA I POUZDANOST
- REGULATORNE OKOLNOSTI

FAKTORI KOJI UTJEČU NA RAZVOJ INDUSTRIJSKIH EKOSISTEMA





Ključno je kod
razvoja industrijskih
sistema imati na umu
sljedeće:

Analitičare/planere

Agente

Upravu/donosioce
odluka u
kompanijama

PROVOĐENJA OPTIMIZACIJE

- IZ OVOG PITANJA PROIZLAZE TRI SCENARIJA:

1.OPTIMIZACIJA IZVANA

2. OPTIMIZACIJA IZNUTRA

3. ULOGA BROKERA

EKO-INDUSTRIJSKI PARKOVI (EIP)

- EIP JE SKUPINA PROIZVODNIH I USLUŽNIH TVRTKI LOCIRANIH ZAJEDNO.
- CILJ EIP-A: POBOLJŠATI EKONOMSKU UČINKOVITOST SMANJUJUĆI UČINAK TVRTKI U PARKU NA OKOLIŠ.
- ZAJEDNICE I TVRTKE KOJE STVORE EIP-OVE > TEMELJ ZA INDUSTRIJSKI RAZVOJ KOJI JE KONKURENTNIJI, EFIKASNIJI I ČIŠĆI NEGO U TRADICIONALNIM INDUSTRIJSKIM PARKOVIMA.

EKO-INDUSTRIJSKI PARK KALUNDBORG



Sl. 2. Termoelektrana Asnæs

Izvor: <https://www.touristlink.com/denmark/kalundborg-eco-industrial-park/overview.html>

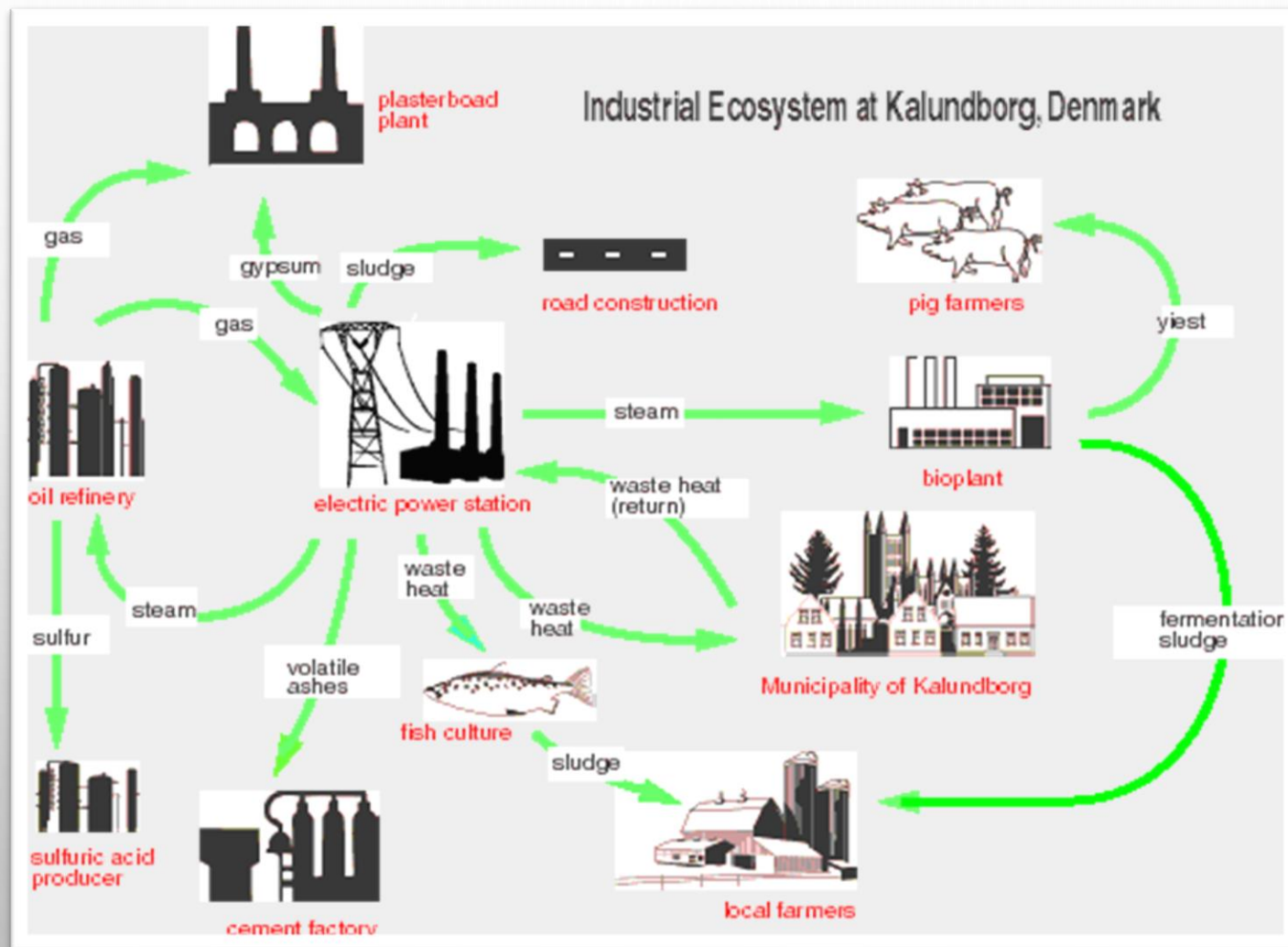


Sl. 1. Položaj
općine
Kalundborg



Sl. 3. Pogled na Kalundborg

Industrijski ekosustav Kalundborg



Sl. 4. Funkcioniranje eko-ind. parka u Kalundborgu

KORISTI OD EIP

Tvrtke

- nastaju zahvaljujući štednji i novim prihodima, zajedničkim uslugama, smanjenom regulatornom osnovom i povećanom konkurentnošću.

Zajednica

- uživa u čistijem i zdravijem okolišu, razvoju novih poslova i zapošljavanju, privlačenjem novih tvrtki te smanjenom konfliktu između ekonomije i okoliša.

Vlade

- primaju veće dohotke od novih poreza, smanjuje se trošak za zdravstvene i štete u okolišu te smanjuje potražnja za javnom infrastrukturom

Okoliš

- manje je zagađenje a može doći i do prirodne obnove.

STRATEGIJE ZA OBLIKOVANJE EIP-A

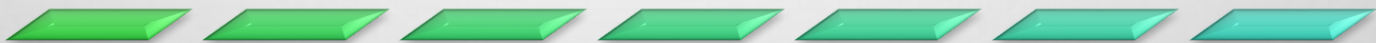
Integracija u prirodne sisteme



Energetski sistemi



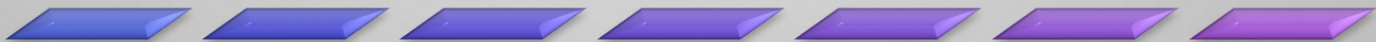
Tokovi materijala i upravljanje



Voda



Uspješno upravljanje EIP-om

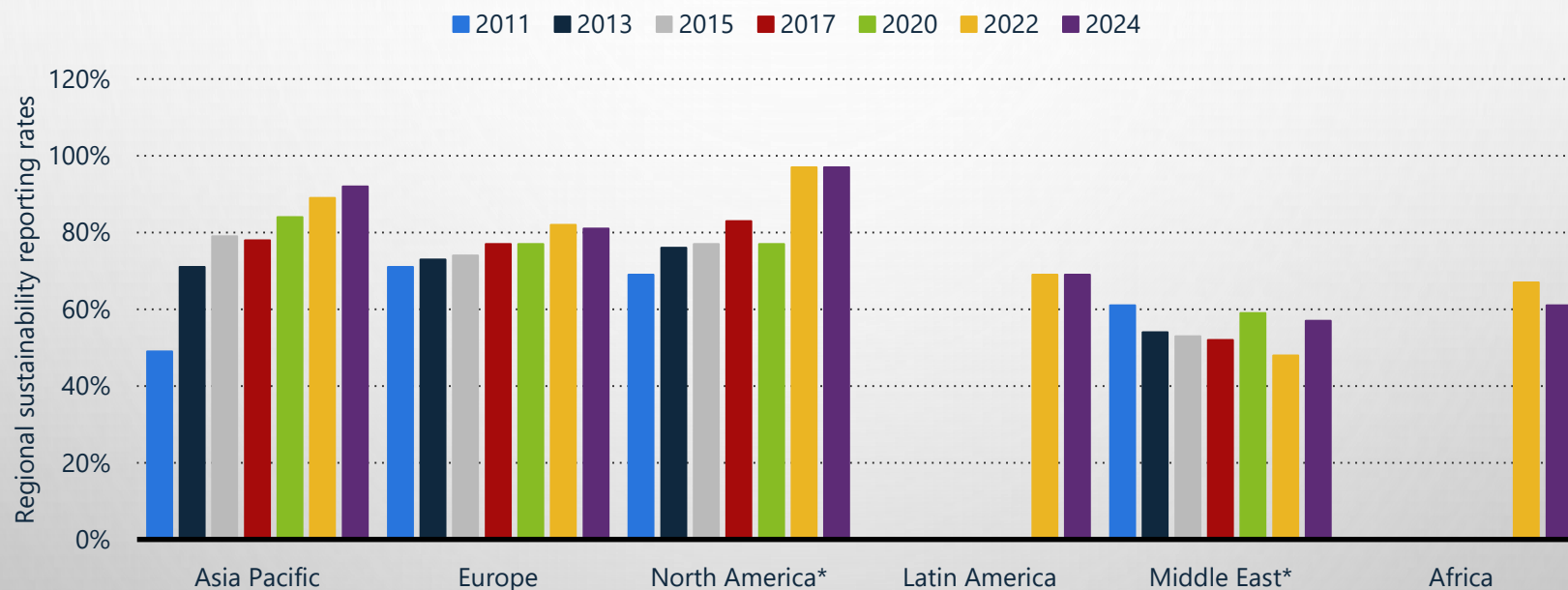


The background of the slide is a light gray gradient. In the top-left and bottom-right corners, there are several realistic-looking water droplets of various sizes, some overlapping. The text is centered in the upper half of the slide.

ODRŽIVI RAZVOJ PROSTORA I NEKI PRIMJERI ODRŽIVE (INDUSTRIJSKE) PRAKSE

Sustainability reporting rates of firms worldwide from 2011 to 2024, by region

Sustainability reporting rates of firms worldwide 2011-2024, by region



Note(s): Worldwide; 2011, 2013, 2015, 2017, 2020, 2022 and 2024

Further information regarding this statistic can be found on [page 8](#).

Source(s): KPMG International; ID 1338724



Greenfields vs brownfields

- **GREENFIELDS:** PODRUČJA NA KOJIMA SE JOŠ UVIJEK NE NALAZI INDUSTRIJA, ALI SU PREDVIĐENA ZA NJENU IZGRADNJU TJ. NOVE INVESTICIJE.



Sl. 3. Prikaz greenfield površine

- **BROWNFIELDS** > PODRUČJA IZ KOJIH JE (STARA) INDUSTRIJA NESTALA ILI JE U PROCESU PROPADANJA.



SL. 5.,6. BROWNFIELDS

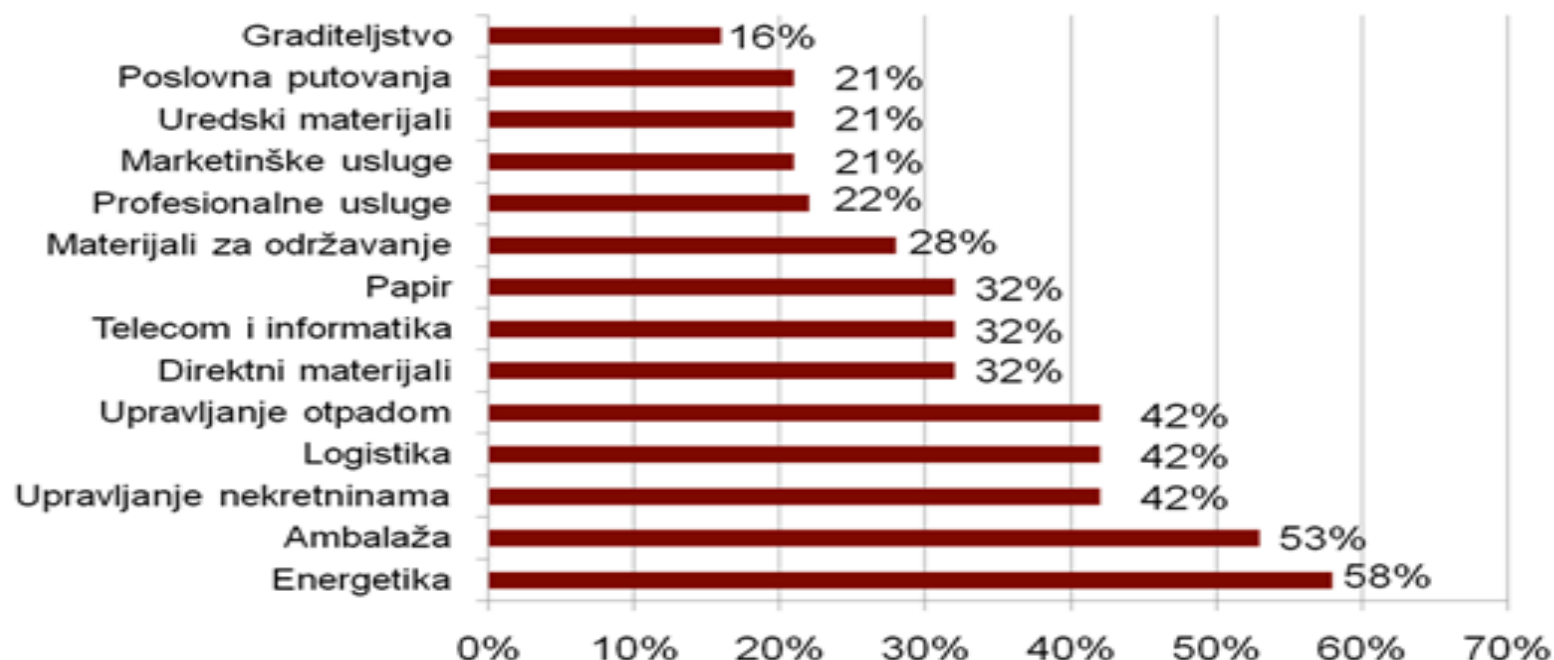


SL. 7. PRIMJERI PRENAMJENE BROWNFIELDA

“ZELENE INDUSTRIJE”

- POSTAJU SVJETSKIM TRENDOM
- UPRAVLJANJE UGLJIČNIM OTISKOM U GLOBALNIM KOMPAIJAMA > KLJUČNO JE PITANJE KOJIM SE BAVI GLOBALNO IZVJEŠĆE O UGLJIČNOM OTISKU (CDP - CARBON DISCLOSURE PROJECT).
- ISTRAŽIVANJE JE PROVELA KONZULTANTSKA KUĆA A.T. KEARNEY, 2010.G.

Udio korištenja “zelenih praksi” unutar pojedinih nabavnim kategorija

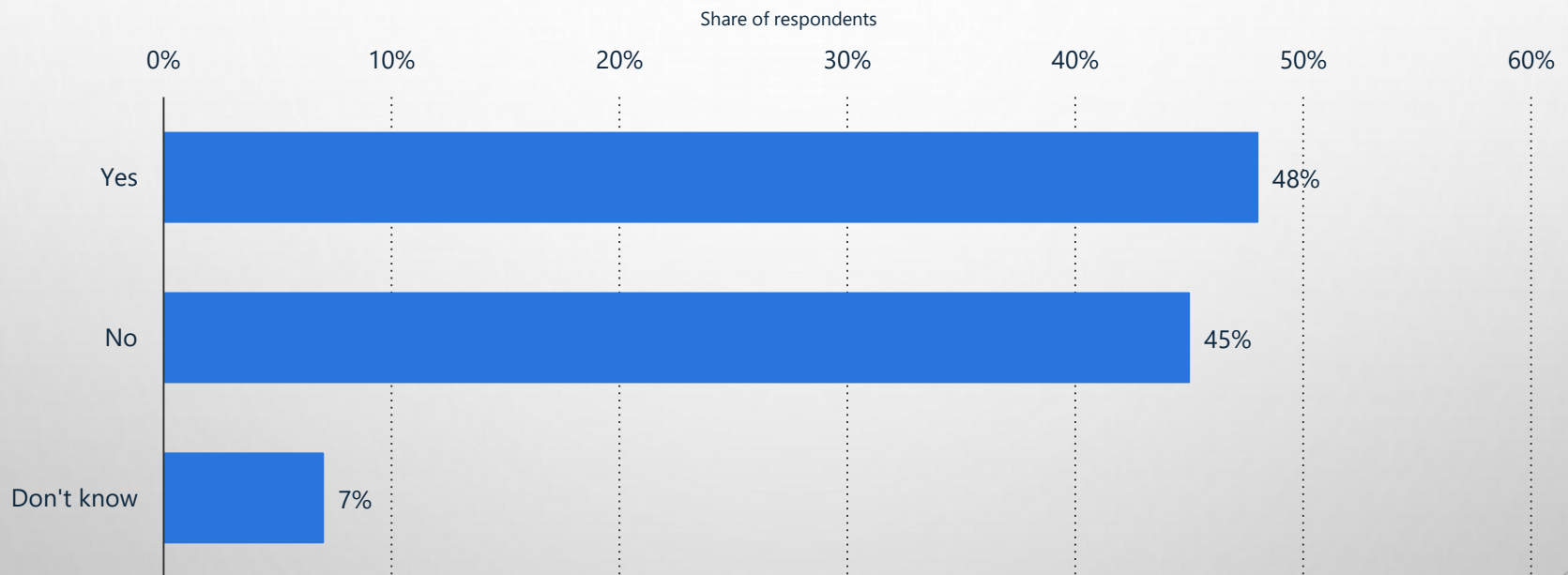


Sl. 8. Udio zelenih praksi

- 89 % TVRTKI IMA STRATEGIJU KAKO UKLJUČITI PITANJE UGLJIČNOG OTISKA U ODNOS S DOBAVLJAČIMA.
- ČAK 90 % > PROGRAM SMANJENJA UKUPNIH EMISIJA U OKOLINU TE SMANJENJE UPORABE ENERGIJE.
- IZ 500 NAJVEĆIH TVRTKI NA SVIJETU > OKO 50 % TVRDI DA PROVODI NAVEDENE MJERE.

Does your organization have a defined sustainability initiative that includes carbon footprint tracking of cloud use?

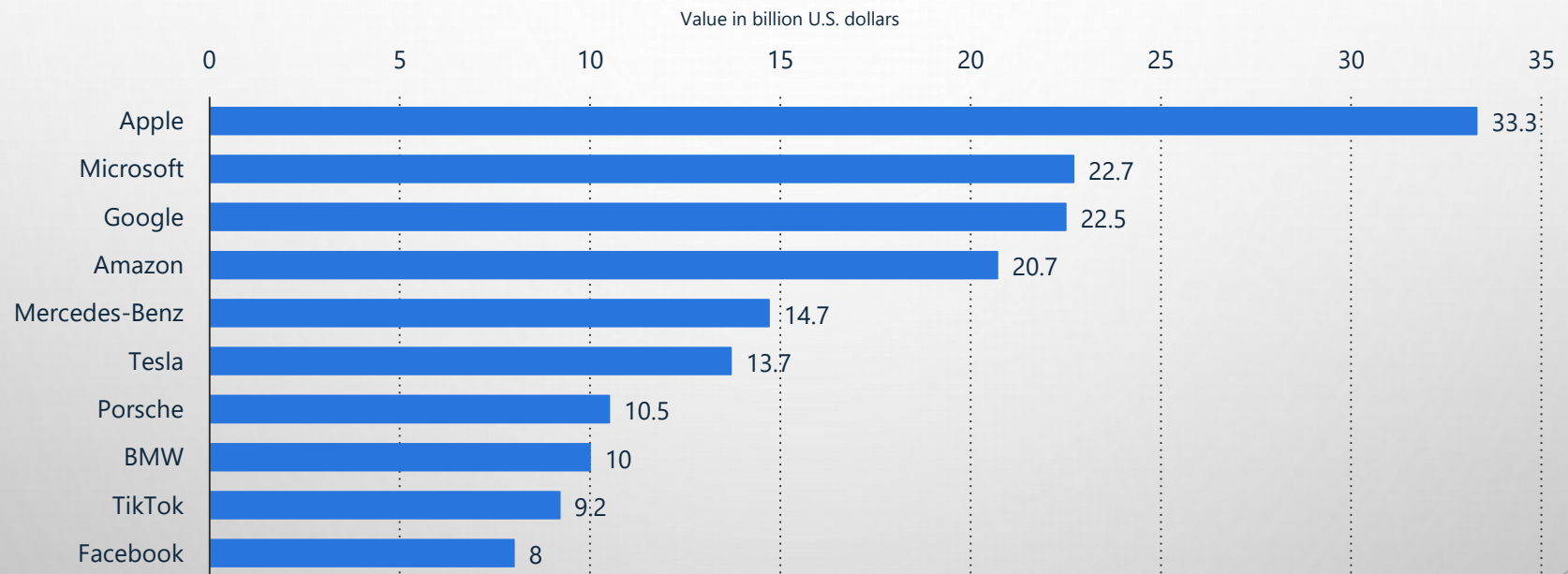
Sustainability initiatives and carbon footprint tracking of cloud usage global 2024



Note(s): Worldwide; 2024; 753 respondents; Technical professionals across a cross-section of organizations
Further information regarding this statistic can be found on [page 8](#).
Source(s): Flexera Software; [JD_1471572](#)

Leading brands worldwide in 2024, by sustainability perception value (in billion U.S. dollars)

Brands perceived as most sustainable worldwide 2024



Note(s): Worldwide; 2024

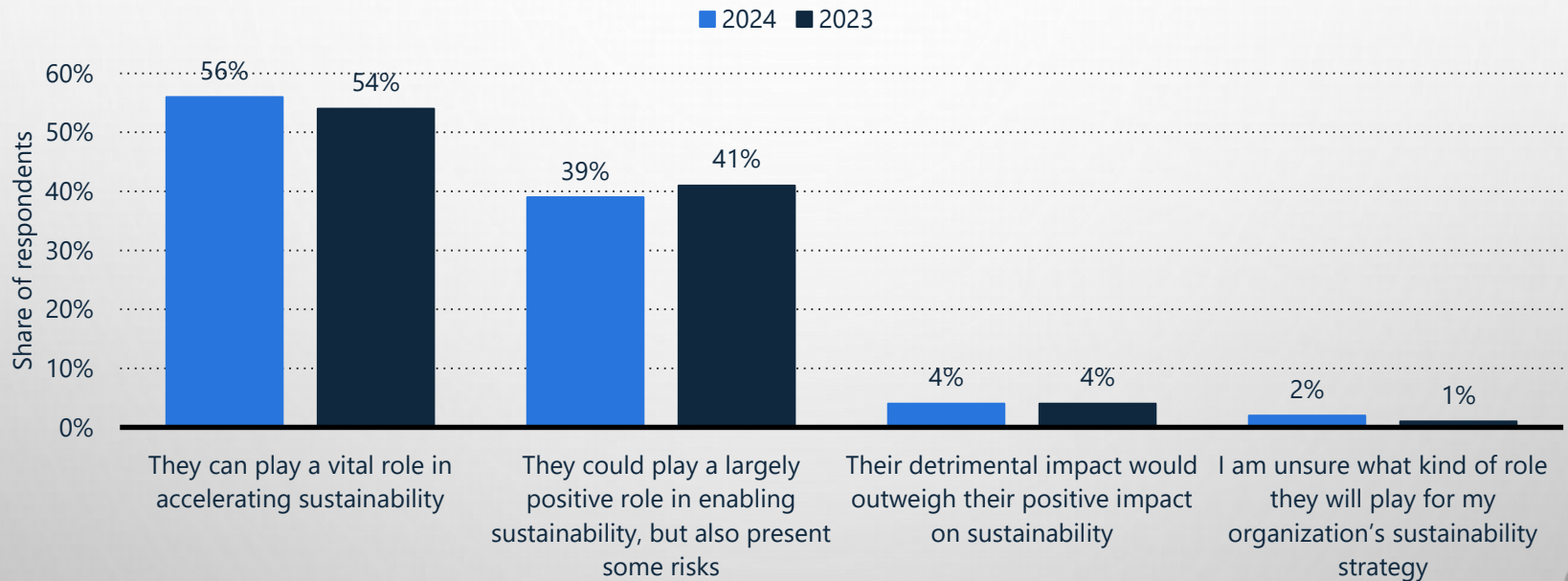
Further information regarding this statistic can be found on [page 8](#).

Source(s): Brand Finance; [ID 1487920](#)

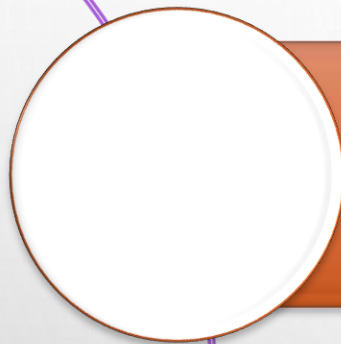


Which of the following best describes your view of how emerging technologies could impact your organization's long-term sustainability?

Global firms view of emerging technologies impact on long-term sustainability 2024



Note(s): Worldwide; November 2023; 1405 respondents; Respondents who are "moderately knowledgeable" and above about their organization's IoT and 5G initiatives
Further information regarding this statistic can be found on [page 8](#).
Source(s): EY; ID 1482593



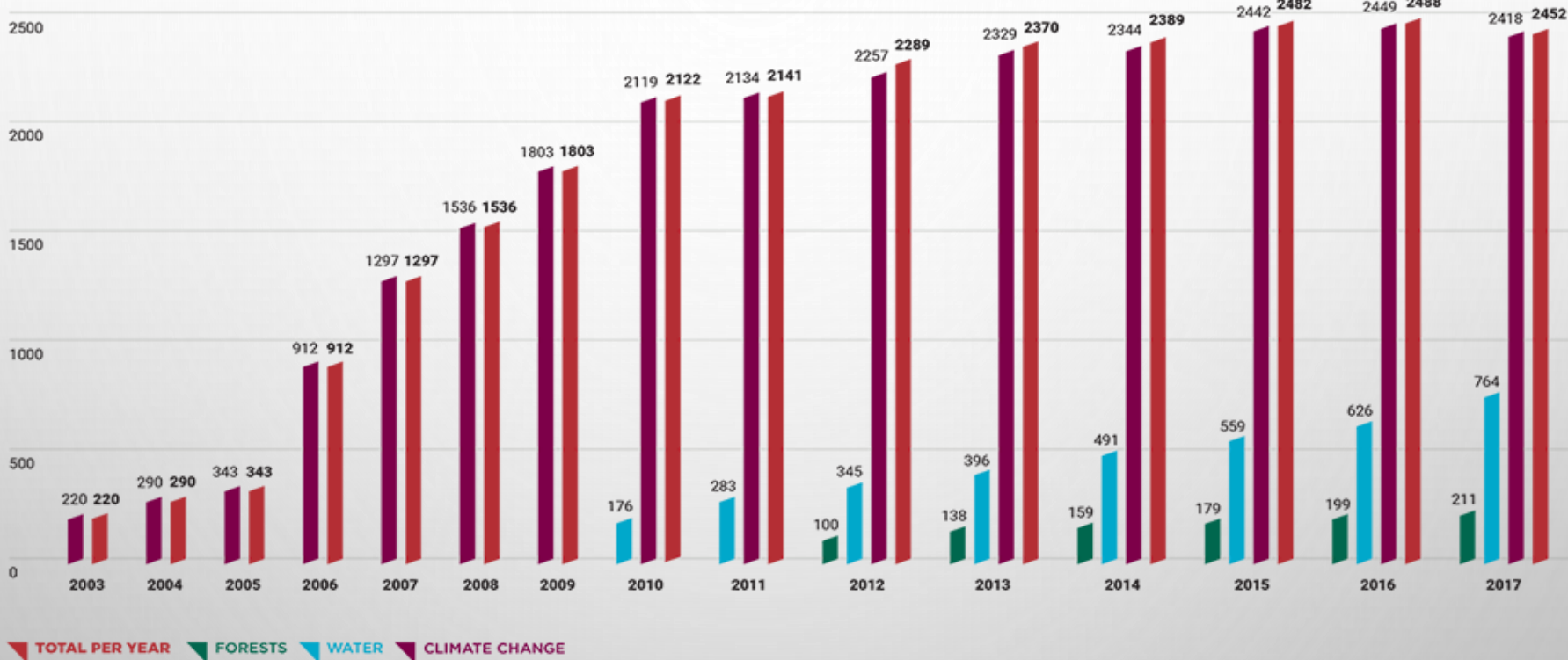
Situacija se poboljšala u odnosu na prošlu godinu: te se tvrtke ponašaju ekološki savjesnije.



Područja poboljšanja > odnose se na mjerenje emisije stakleničkih plinova u lancu opskrbe i davanje značaja smanjenju emisije stakleničkih plinova.

GROWTH IN DISCLOSING COMPANIES SINCE 2003

3000 COMPANIES



Notes

Figures for each programme do not include 'See Another' (SA) companies (i.e. subsidiary companies whose response is covered by their parent company's response)

Figures for 'Total disclosing companies' are unique (i.e. companies responding to multiple programmes are counted only once)

SL.10. UDIO RASTA KOMPA NIJA KOJE SU UKLJUČENE U CARBON DISCLOSURE PROJECT

AUTOINDUSTRIJA: EKO, NAPRIJED!

- VEĆINA MEĐU NAMA NE MOŽE BEZ AUTOMOBILA
- SVAKODNEVNO, U GRADOVIMA, NA KRATKIM ILI DUŽIM RELACIJAMA, OD KUĆE DO POSLA I NATRAG...
- NAŠ AUTOMOBILIZIRANI NAČIN ŽIVOTA, KOD NEKIH NOTORNO OVISNIČKI NAČIN, IMA GOLEMI UTJECAJ NA OKOLIŠ...
- BOLJI I DOSTUPNIJI JAVNI PRIJEVOZ, VIŠE LJUDI NA BICIKLIMA, EVENTUALNO, PRIJEVOZ VIŠE OSOBA U AUTOMOBILU I SL. SAMO SU NEKI OD MOGUĆIH NAČINA DA SVIJET UČINIMO ZELENIJIM MJESTOM.



Sl. 11.-13. Posljedica automobilizacije – prometne gužve, smog, zdravstveni problemi, ...

New passenger car registration in the European Union in 2023, by leading powertrain

New car registrations by leading powertrain in the EU 2023



PROMIŠLJANJA O AUTO-INDUSTRIJI. KAKO DALJE?

Hibridna i električna vozila

- igraju sve veću ulogu

Hibridno vozilo

- je bilo koje vozilo koje kombinira dva ili više izvora energije i koje izravno ili neizravno dobiva pogon

Postoje dva razloga zašto vozila koriste hibridni pogon:

- Smanjenje emisije štetnih plinova

- Smanjenje potrošnje goriva

Izvori energije za vozilo mogu biti:

Vodik

Komprimirani
zrak

Vjetar

Plin

Ljudska
energija ili
snaga

Solarna
energija



1. Hibridna vozila

Hibridno vozilo kombinira mogućnosti klasičnog motora s elektro-motorom

S jednim tankom goriva moguće je voziti se na 50% veće udaljenosti

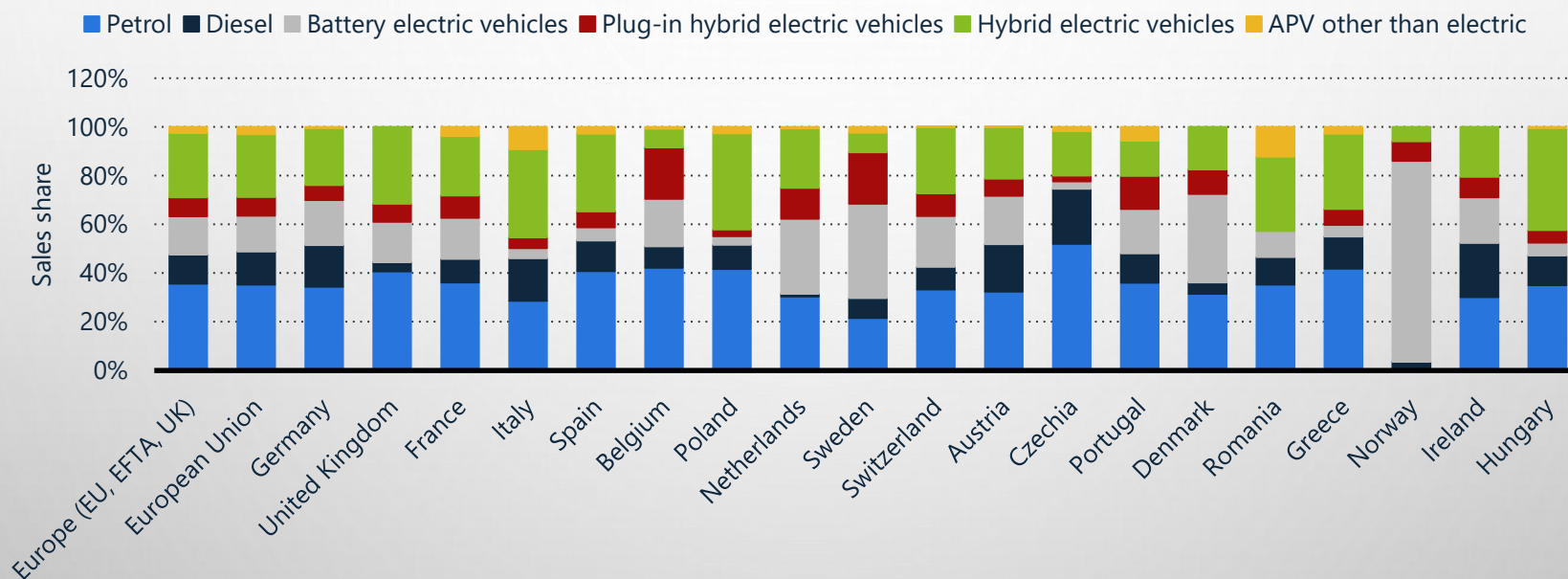
Stvara drastično manje količina štetnih plinova

Hibridni pogon nije novi izum, koristi se već godinama (od 1900.)

Najpoznatije primjene hibridnog vozila su podmornica i lokomotiva

Passenger car sales in selected European countries in 2023, by fuel type

Share of fuel types of new passenger cars in Europe by country 2023



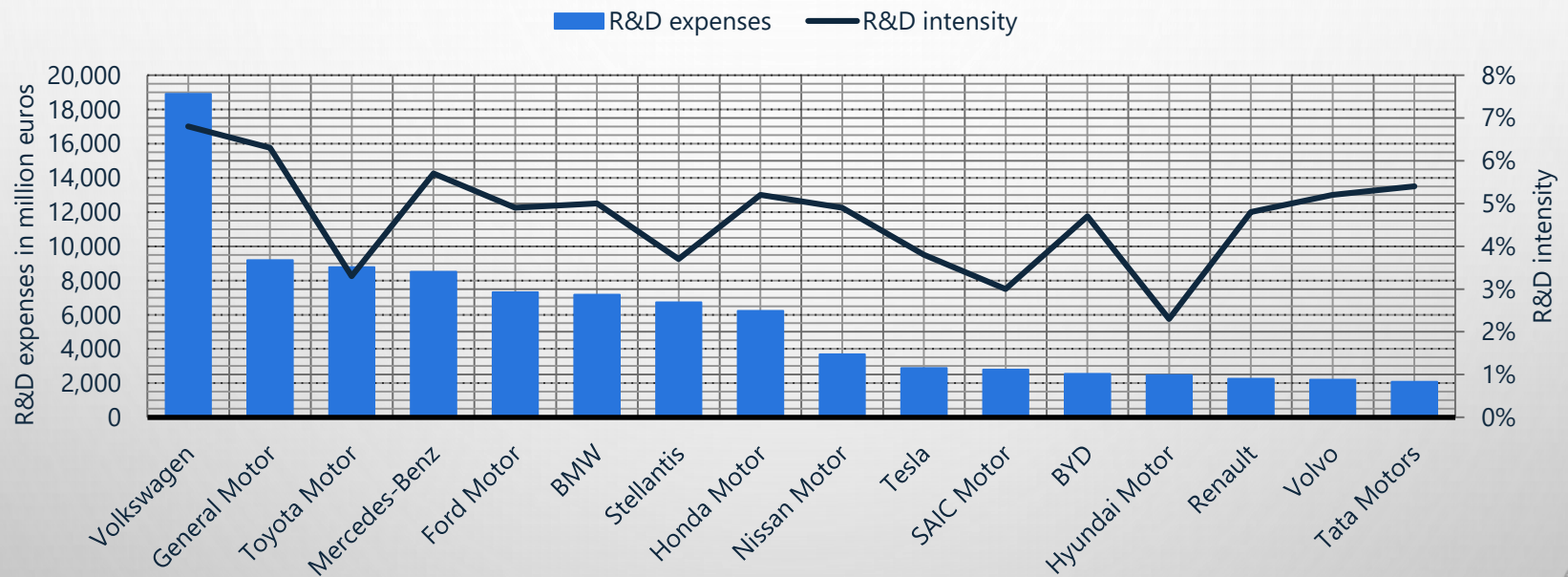
Note(s): EU; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): ACEA; Statista; ID 500546

Research and development expenses and intensity of selected global automotive manufacturers in 2022 (in million euros and percent)

R&D expenses and intensity of selected automotive companies worldwide 2022



Note(s): Worldwide; 2022

Further information regarding this statistic can be found on [Page 4](#).

Source(s): European Commission; [ID 1306984](#)

- EKO KAMPANJA SVJETSKIH PROIZVOĐAČA AUTOMOBILA GLOBALNA JE ČINJENICA.
- LUKSUZNI AUTOMOBILI NA HIBRIDNI POGON > FERRARI, BMW, TESLA
...
- NEKE DRŽAVE SUBVENCIONIRAJU KUPNJU EL.VOZILA



POTICANJE KORIŠTENJA HIBRIDNIH I ELEKTRIČNIH VOZILA U RH

- PREMA PODACIMA ENERGETSKOG INSTITUTA HRVOJE POŽAR - EMISIJE CO₂ U UKUPNOM DOMAĆEM PROMETU IZNOSE OKO 5,6 MIL. TONA.
- OD TOGA NA CESTOVNI PROMET OTPADA GOTOVO 3 MIL. TONA.
- U RH JE DANAS REGISTRIRANO VIŠE OD 2 MILIJUNA CESTOVNIH VOZILA, OD ČEGA JE GOTOVO 1,5 MILIJUNA OSOBNIH AUTOMOBILA.
- PROSJEČNO OSOBNO VOZILO U RH GODIŠNJE EMITIRA OKO 3 TONE CO₂.
- HIBRIDNO VOZILO GODIŠNJE EMITIRA 1 TONU CO₂.
- ELEKTRIČNA VOZILA UOPĆE NEMAJU EMISIJA NITI ZAGAĐUJU OKOLIŠ BUKOM.

- S CILJEM POTICANJA ČISTIJEGR TRANSPORTA U RH I SMANJENJA ONEČIŠĆENJA ZRAKA, 2014. GODINE JE POKRENUT PROJEKT VOZIMO EKONOMIČNO.
- KROZ NJEGA SE GRAĐANIMA I TVRKAMA DODJELJUJU **BESPOVRATNA SREDSTVA** ZA KUPNJU ENERGETSKI UČINKOVITIJIH VOZILA.
- OD 2014. DO 2019. GODINE JE FOND ZA ZAŠTITU OKOLIŠA I ENERGETSKU UČINKOVITOST SA 109,5 MILIJUNA KUNA SUFINANCIRAO NABAVU **3681** ENERGETSKI UČINKOVITIJEGR VOZILA (ELEKTRIČNIH, HIBRIDNIH TE *PLUG IN* HIBRIDNIH VOZILA).

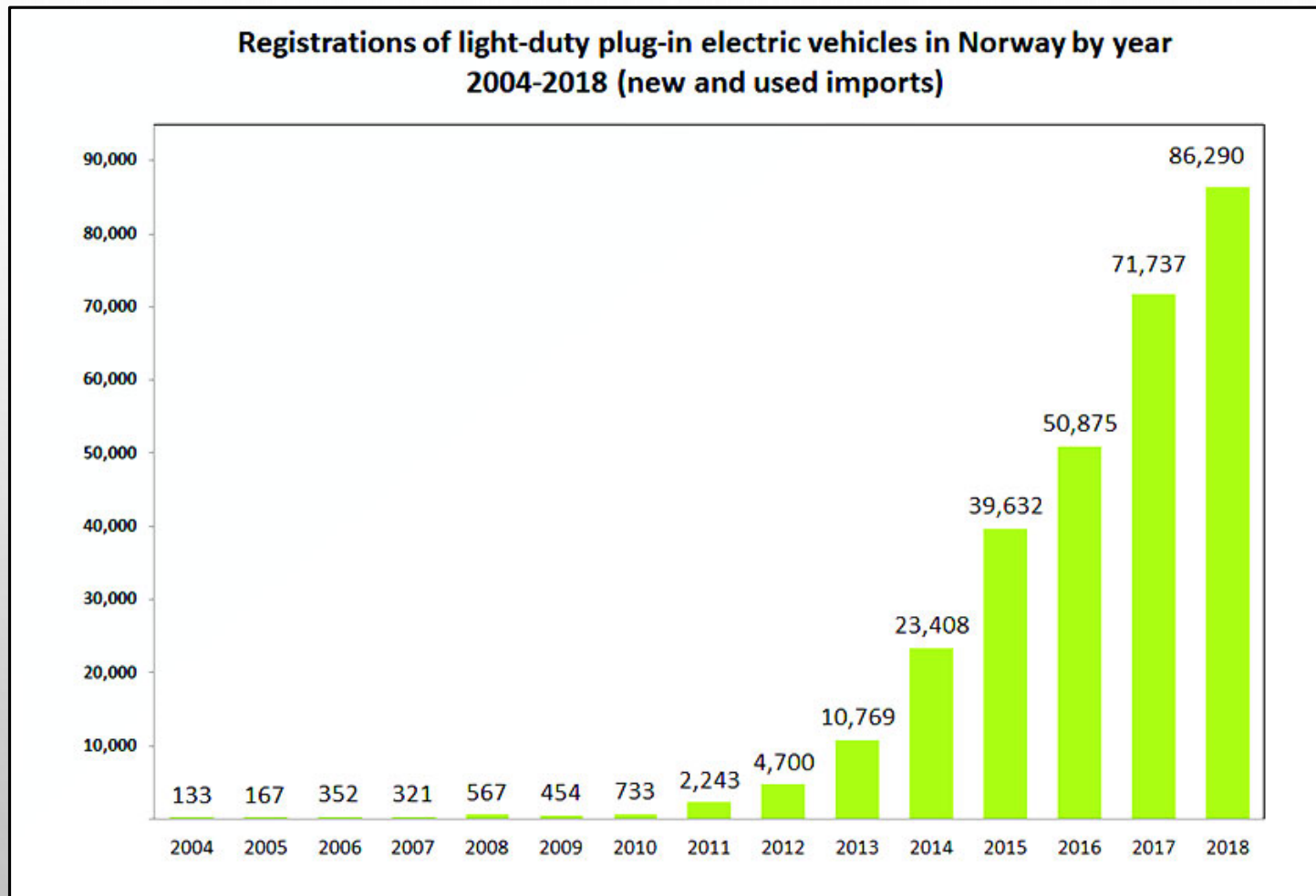
PROGRAM SUFINANCIRANJA ELEKTRIČNIH VOZILA IZ 2019. GODINE

IZNOS POTICAJA – do 40%

VRSTA VOZILA	POGONSKA TEHNOLOGIJA	MAKSIMALNI IZNOS
električni bicikl	Električni pogon	do 5.000,00 kuna
električno vozilo L1, L2, L3, L4, L5, L6 i L7 kategorije	Električni pogon	do 20.000,00 kuna
Vozilo M1 kategorije: - osobna vozila niže i srednje kategorije (gradska i kompaktna vozila), odnosno prema europskoj kategorizaciji tzv. A (mini), B (mali) i C (srednji) segment vozila - vozila tipa SUV (engl. <i>Sport utility vehicle</i>) i MPV (engl. <i>Multi-purpose vehicle</i>) s odgovarajućim podtipovima u okviru A,B,C segmenata	„Plug-in“ hibridni pogon (emisija onečišćujuće tvari CO2 do najviše 50 g/km)	do 40.000,00 kuna
	Električni pogon (emisija onečišćujućih tvari CO2 iznosa 0 g/km)	do 80.000,00 kuna

- PREMA PODACIMA CENTRA ZA VOZILA HRVATSKE, EVIDENTAN JE PORAST ELEKTRIČNIH I HIBRIDNIH VOZILA U POSLJEDNJIH NEKOLIKO GODINA.
- U HRVATSKOJ JE 2012. GODINE BILO SVEGA 13 ELEKTRIČNIH AUTOMOBILA, 2014. GODINE IH JE EVIDENTIRANO 74, 2017. 277, A 2019. GODINE 730.

PRIMJER NORVEŠKE – EL. AUTOMOBILI NEPRESTANO RASTU

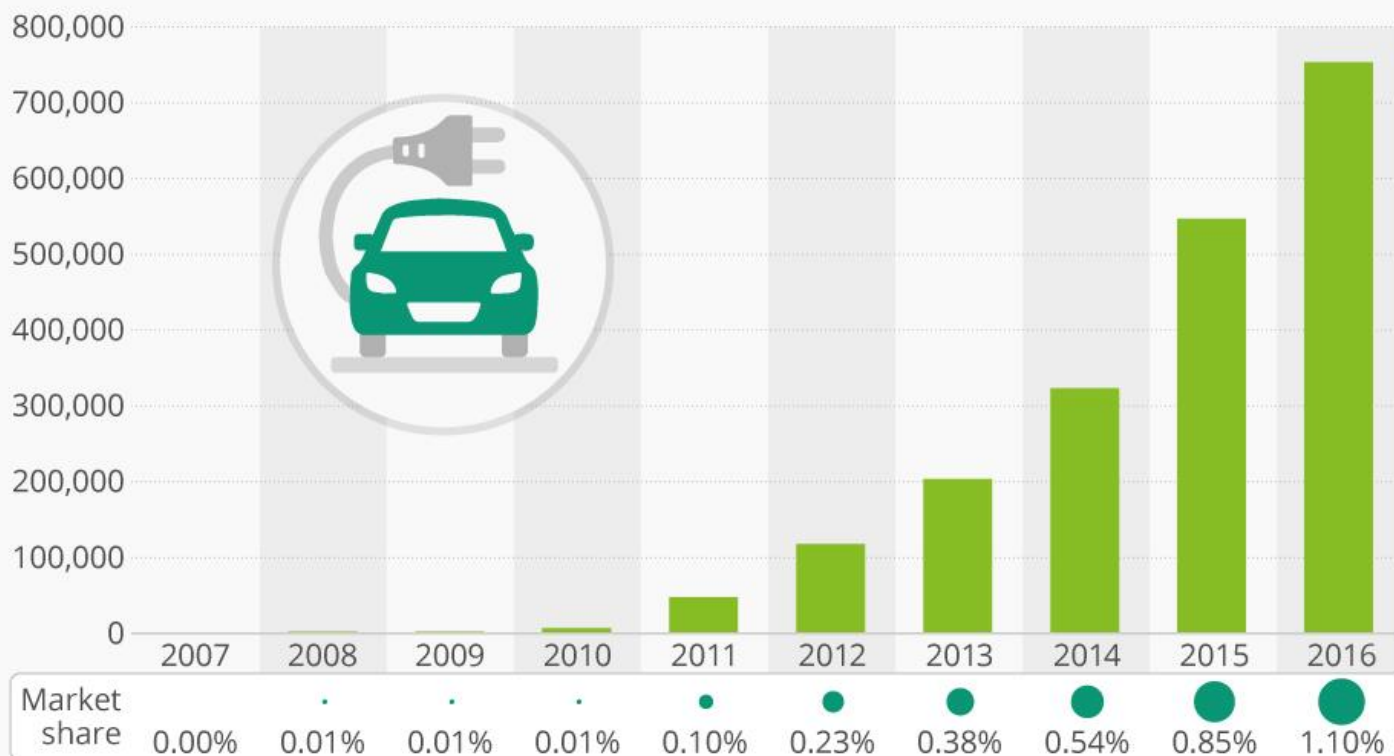


SL. 14. BROJ REGISTRIRANIH AUTOMOBILA NA EL. POGON U NORVEŠKOJ, 2004.-
2018.

NOVI POTENCIJALI U BUDUĆNOSTI?

Electric Cars Have Lots of Room to Grow

New registrations and market share of electric cars worldwide*



* including battery electric cars and plug-in hybrid electric cars

@StatistaCharts

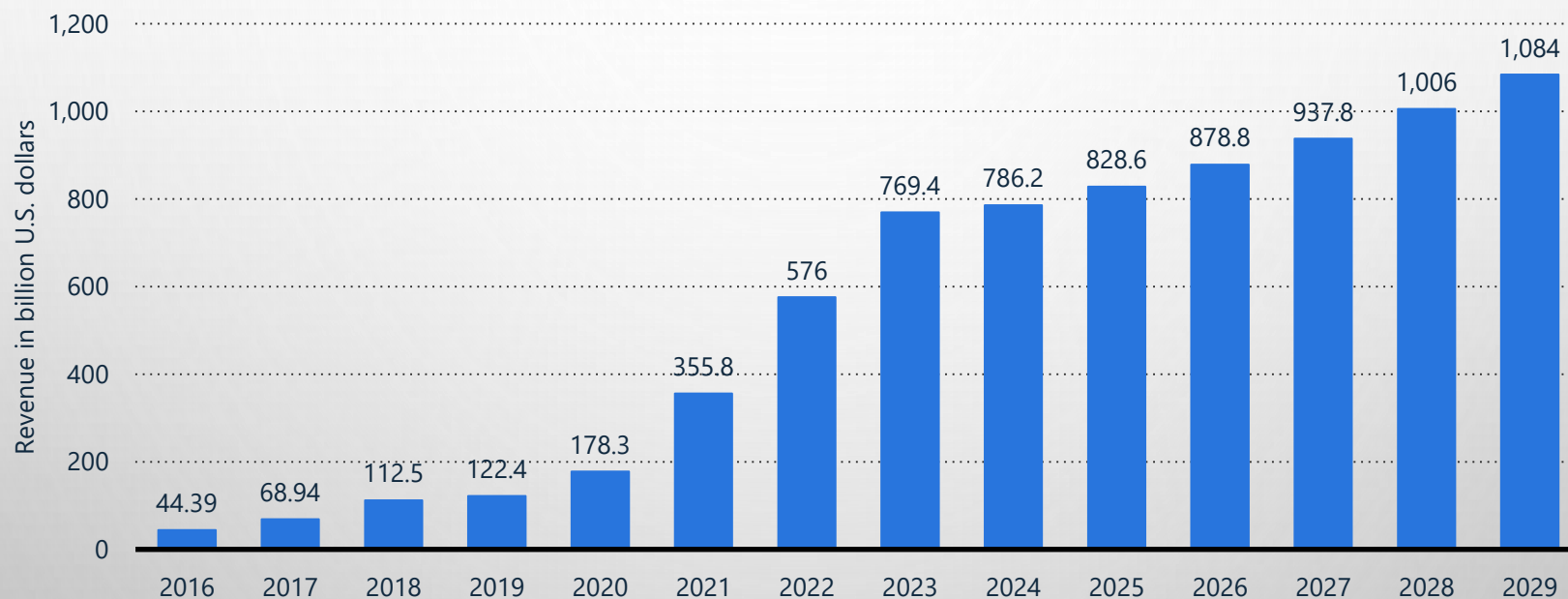
Source: IEA

statista

Sl. 16. Tržište električnih automobila ima još puno prostora za rast

Global revenue for electric vehicles between 2016 and 2023, with a forecast through 2029 (in billion U.S. dollars)

Global electric vehicle revenue forecast 2016-2029



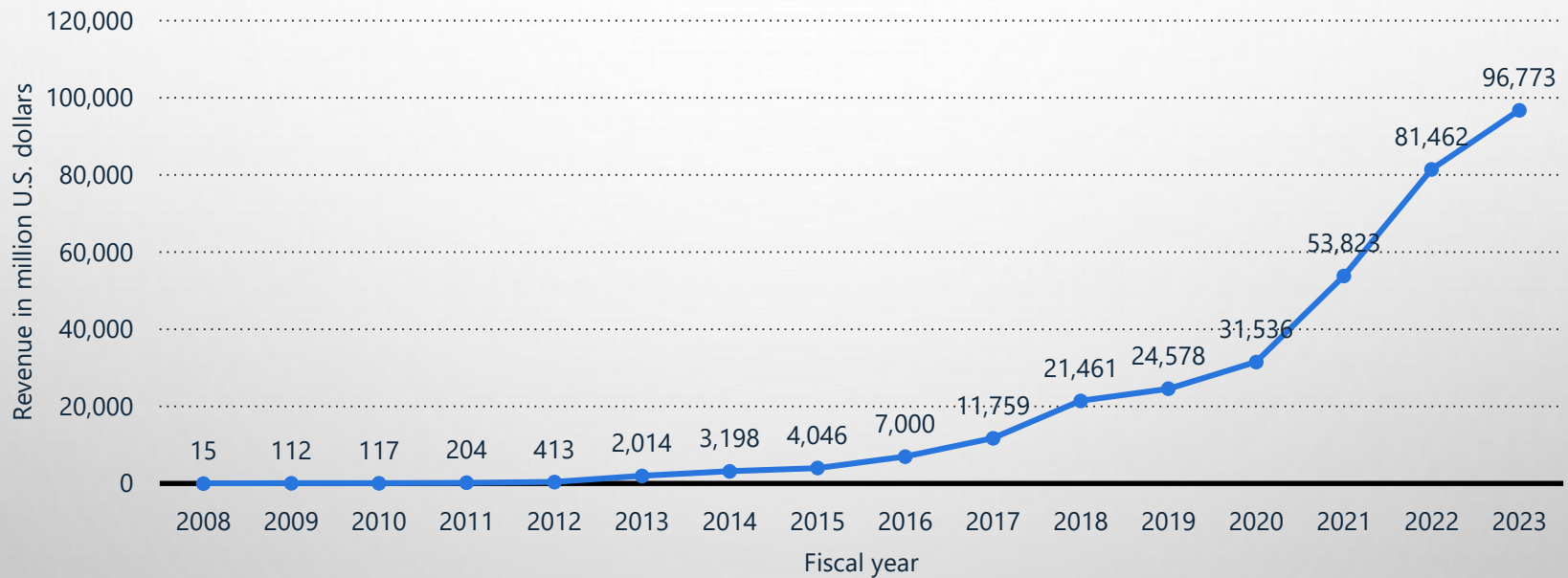
Note(s): Worldwide; 2016 to 2023; based on a forecast modelled in August 2024.

Further information regarding this statistic can be found on [page 8](#).

Source(s): Statista; Statista Mobility Market Insights; [ID 271537](#)

Revenue of Tesla from 2008 to 2023 (in million U.S. dollars)

Tesla revenue 2008-2023



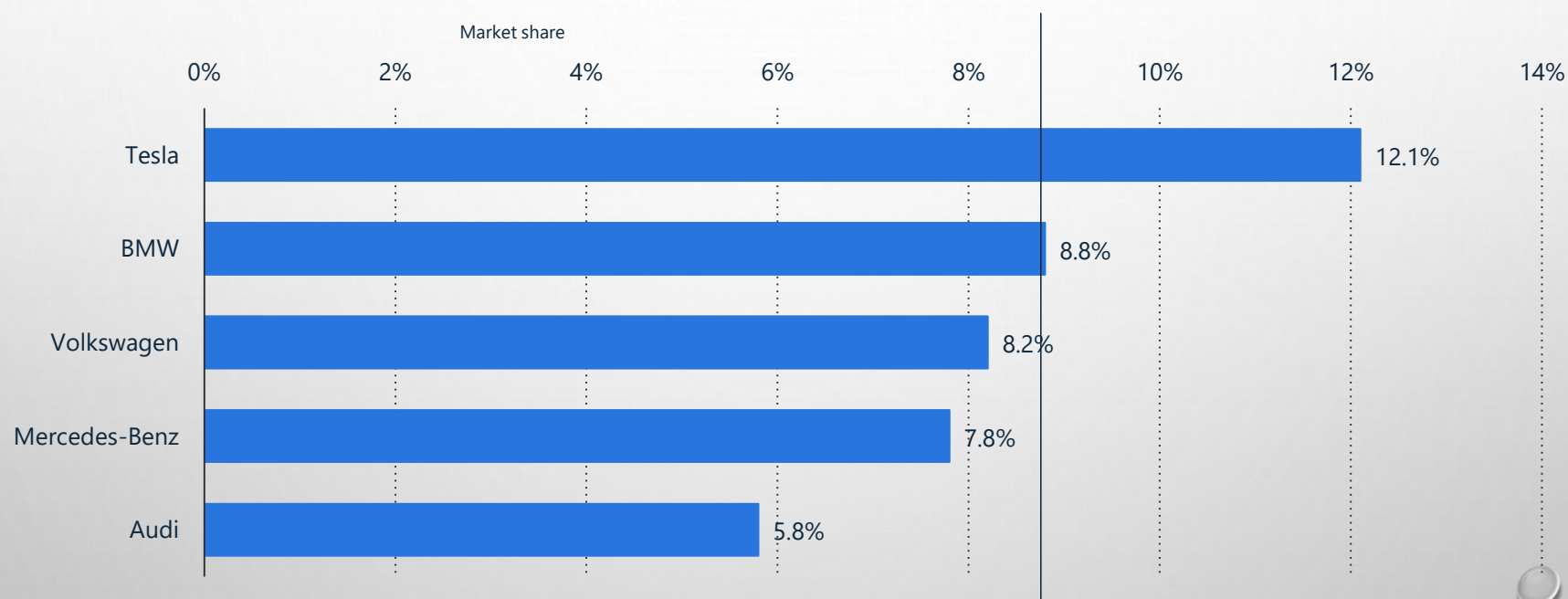
Note(s): Worldwide, United States; 2008 to 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): Tesla; U.S. Securities and Exchange Commission; [ID 272120](#)

Leading electric vehicle brands in Europe in 2023, based on market shares

Europe: best-selling electric vehicle brands by market share 2023



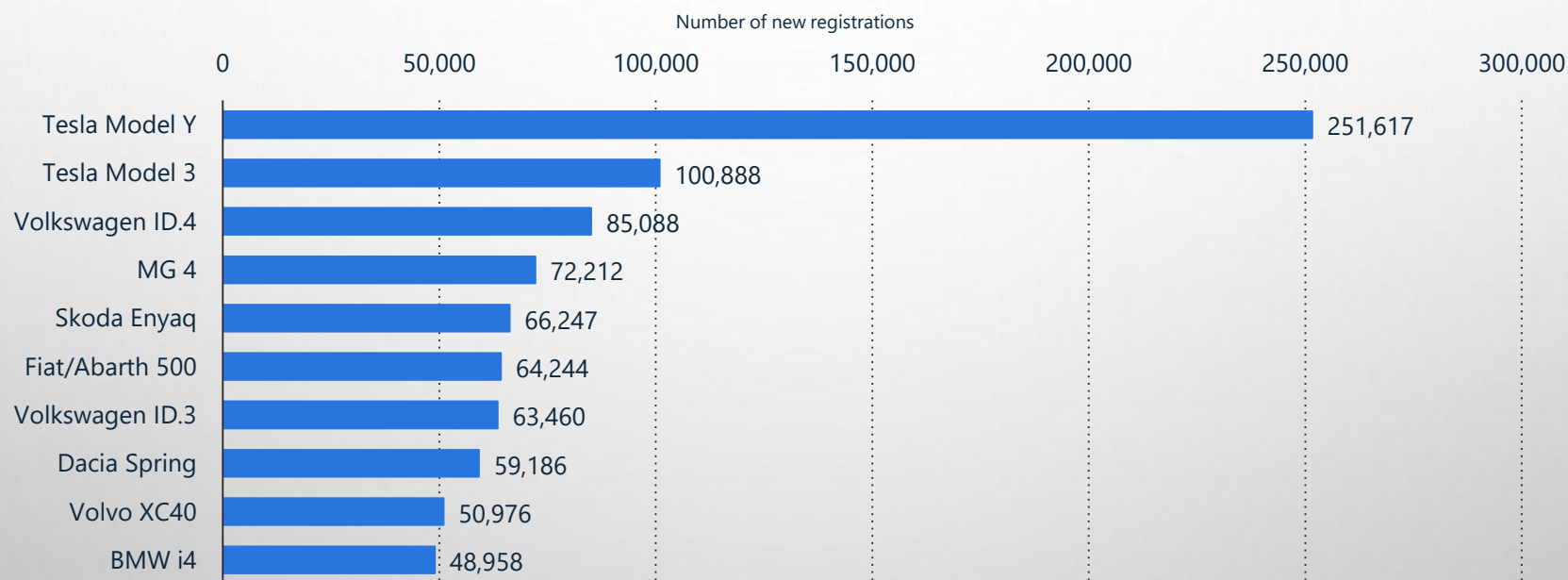
Note(s): Europe; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): Autovista24; EV-Volumes.com; ID 1495834

Leading battery-electric vehicle models based on new registrations in Europe in 2023

Leading battery-electric car models in Europe by new registrations 2023



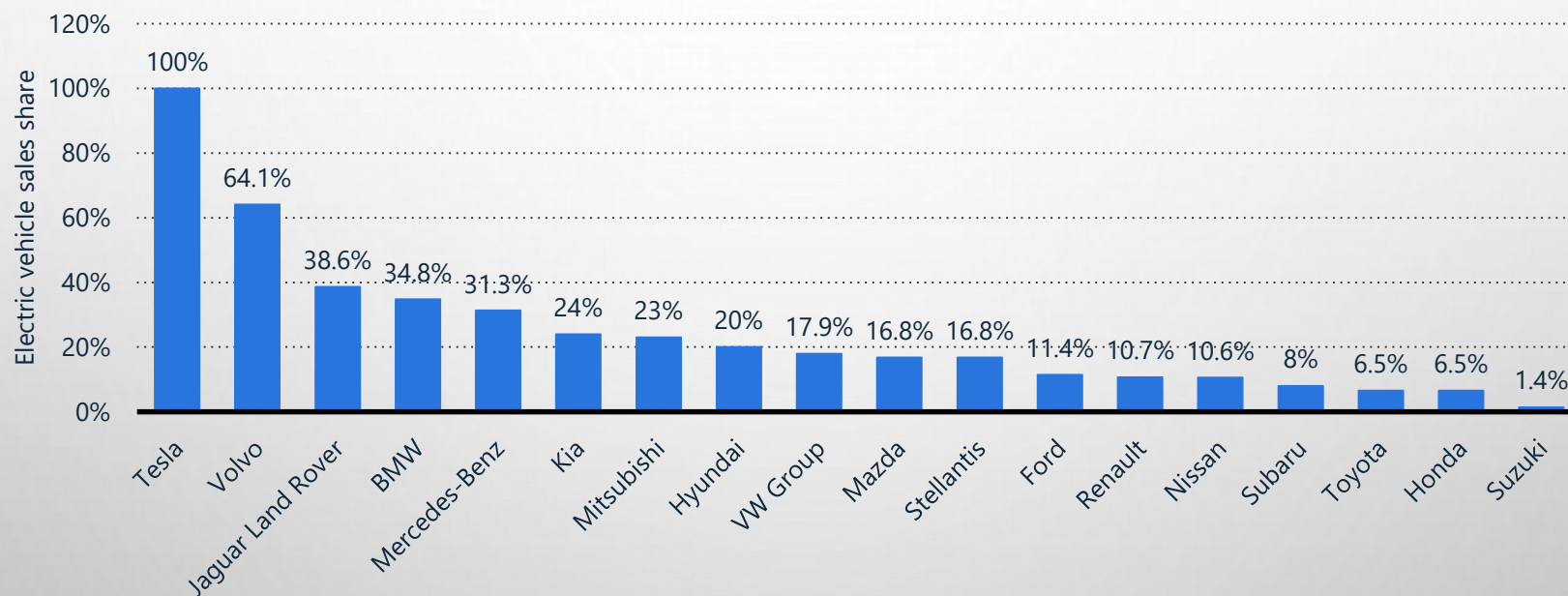
Note(s): Europe; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): JATO; ID 1301916

Share of electric vehicle sales in automotive brands' overall European light vehicle sales in 2023

Electric vehicle share of automotive brands' sales in Europe 2023



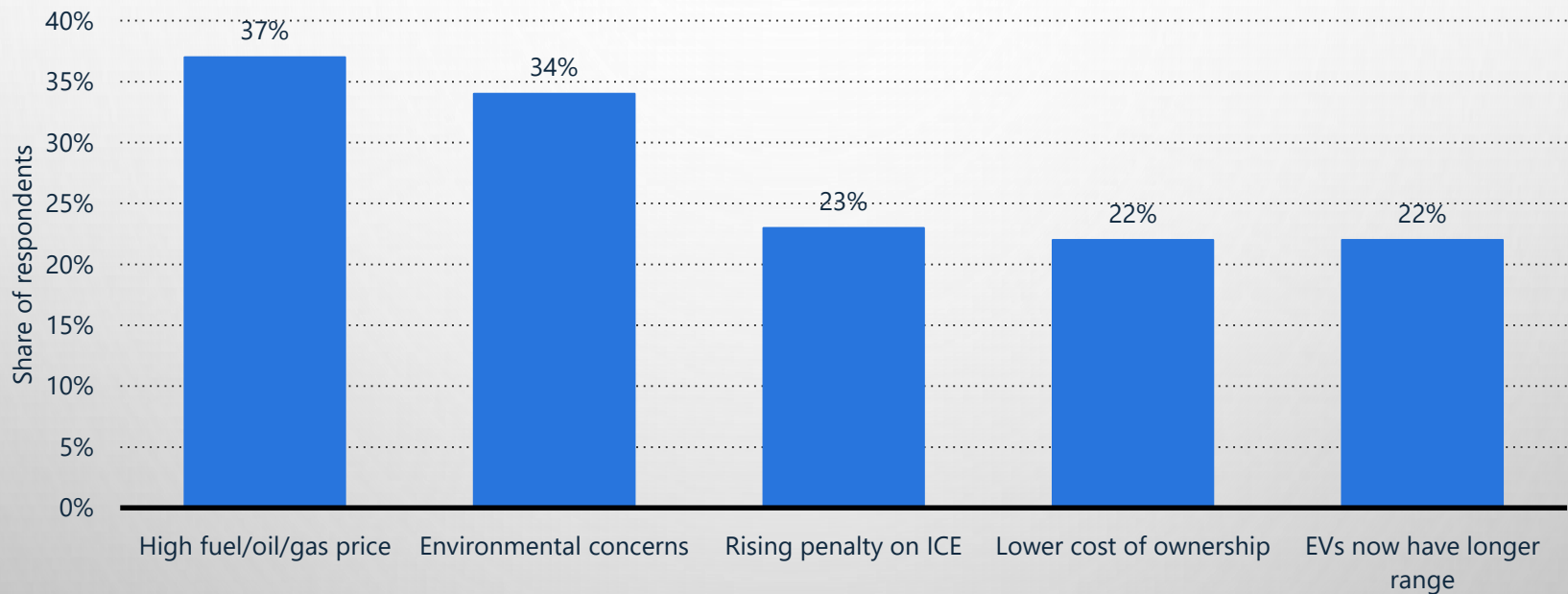
Note(s): Europe; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): ICCT; ID 1417758

Leading reasons motivating the purchase of electric vehicles according to consumers worldwide as of the first half of 2024

Leading reasons motivating EV purchase worldwide 2024



Note(s): Worldwide; first half of 2024; 19,000 respondents

Further information regarding this statistic can be found on [page 8](#).

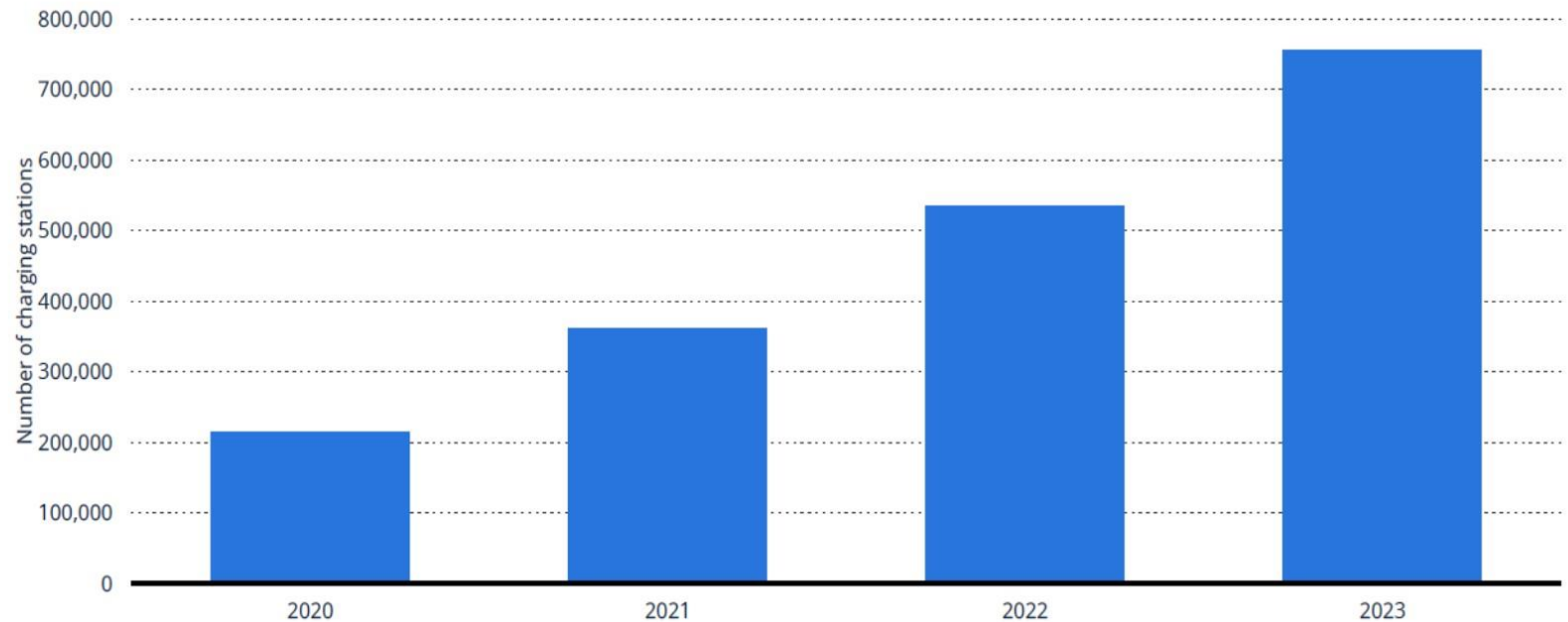
Source(s): EV; ID 1314926

RAZLIKE U NAČINU NAPAJANJA – HIBRIDNA I PLUG IN VOZILA

- Hibridna i priključna hibridna vozila koriste vrlo sličnu tehnologiju.
- **Glavna razlika** između hibrida i baterijskog električnog vozila: u izvoru snage
- -> **hibrid** se nezamjetno prebacuje između dva izvora snage, učinkovitog benzinskog motora i hibridne baterije s automatskim punjenjem.
- -> baterijsko električno vozilo pogonjeno je isključivo strujom iz baterije.
- **Priključni hibridi** su isti, no njihova baterija ima veći kapacitet.
- Baterija se puni putem kućne utičnice ili posebnog zidnog punjača, što znači da u pravilu pružaju bolje performanse i duže se mogu voziti samo na električni pogon, čak do 75 km.
- Nakon toga se prebacuju u hibridni režim rada.

Number of electric vehicle charging points in Europe from 2020 to 2023

Number of electric vehicle charging points in Europe 2020-2023



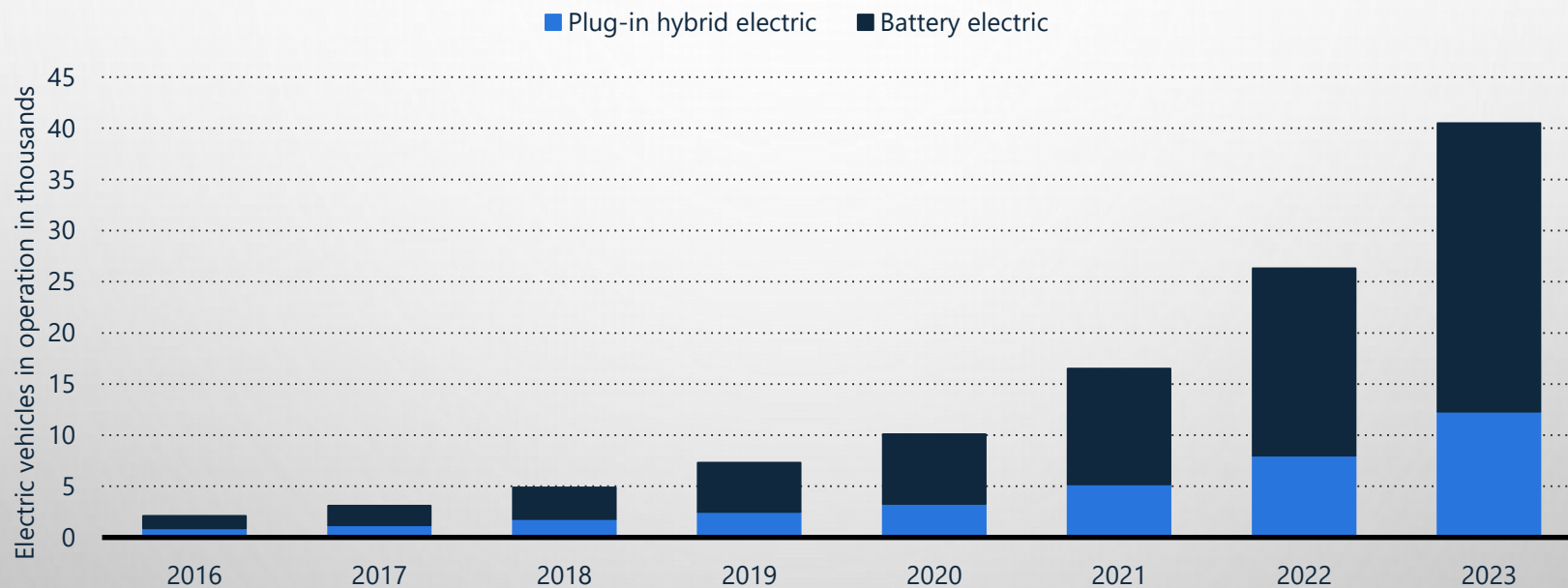
10

Description: In 2023, there were roughly 755,800 public charging stations for electric vehicles in Europe (including Turkey). This figure includes both alternating current and direct current chargers. Figures grew consecutively between 2020 and 2023. [Read more](#)
Note(s): Europe; 2020 to 2023
Source(s): EAFI; Statista

statista

Estimated number of electric vehicles in use worldwide between 2016 and 2023, by type (in 1,000s)

Number of electric vehicles in use by type 2016-2023



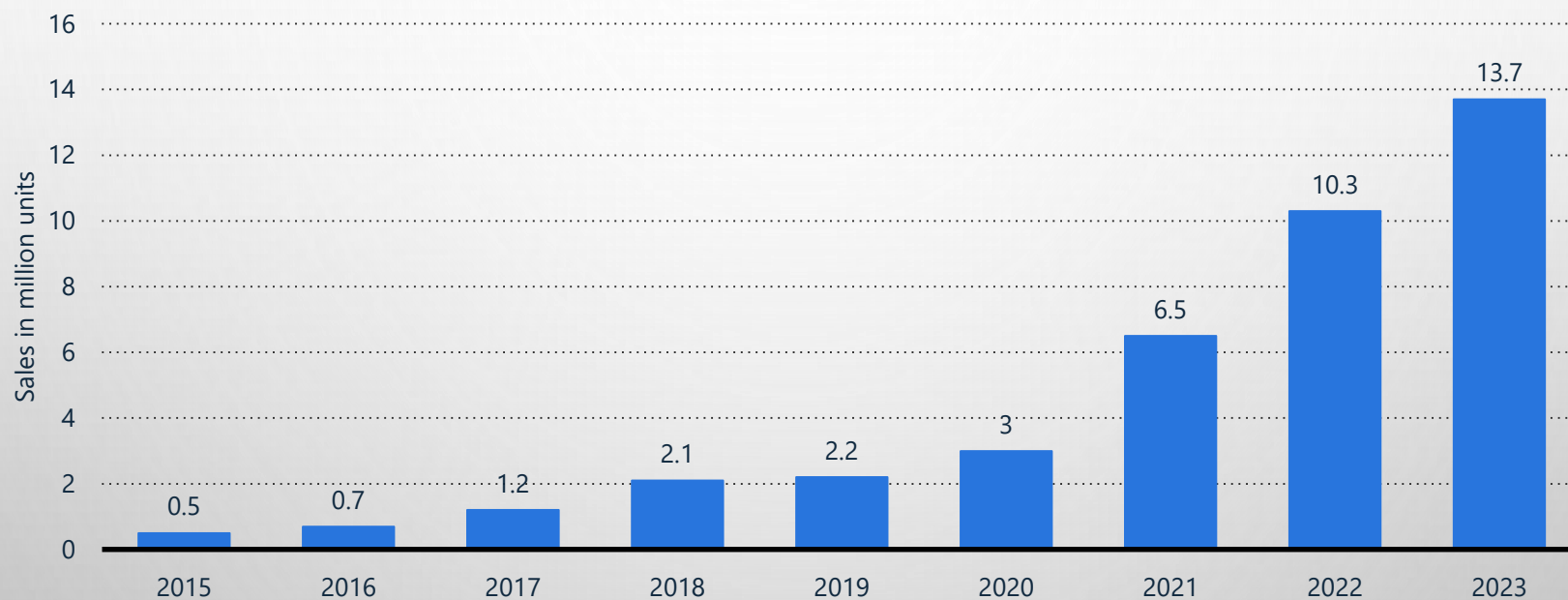
Note(s): Worldwide; 2016 to 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): IEA; Statista; ID 1101415

Estimated plug-in electric light vehicle sales worldwide from 2015 to 2023 (in million units)

Plug-in electric light vehicle sales worldwide 2015-2023



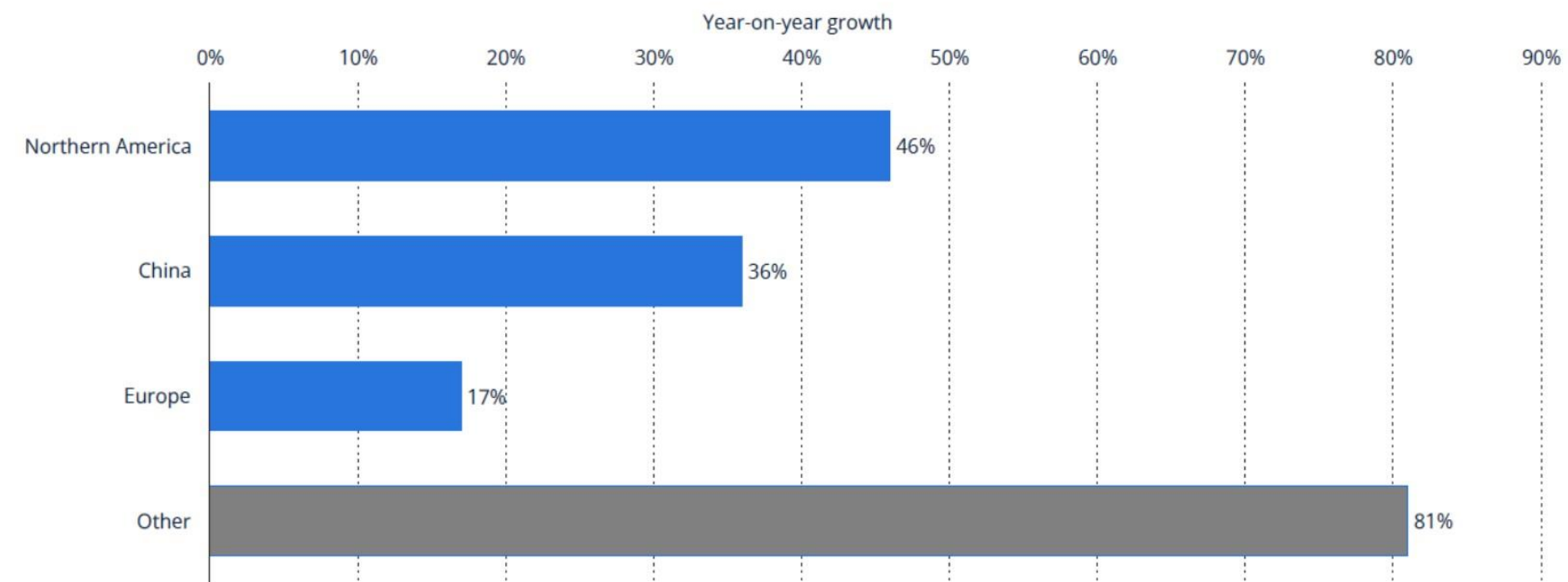
Note(s): Worldwide; 2015 to 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): IEA; [ID 665774](#)

Year-on-year change in new plug-in electric vehicle registrations in 2023, by market

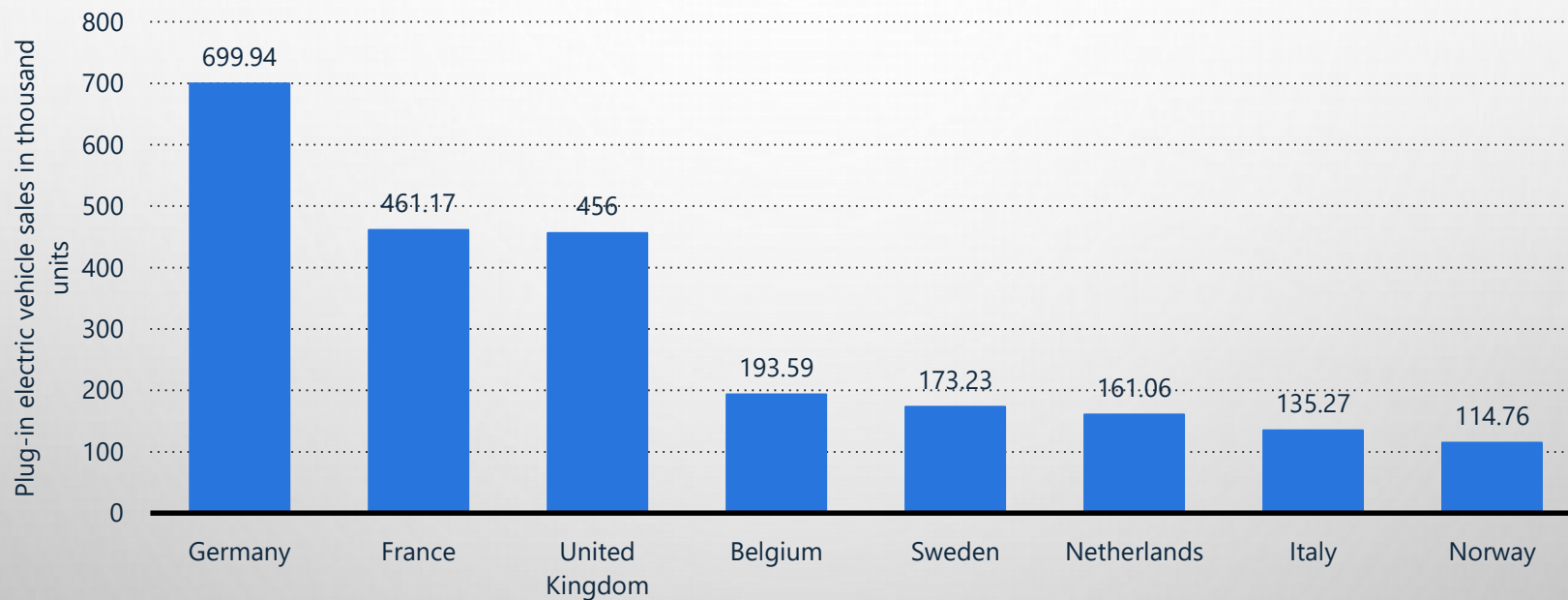
Change in PEV registrations worldwide by market 2023



5 | Description: Chinese battery electric vehicle (BEV) and hybrid electric vehicle (PHEV) registrations increased by 36 percent year-on-year in 2023. Global plug-in electric vehicle (PEV) sales came to around 14 million units in 2023. [Read more](#)
Notes: Worldwide; January through December 2023
Sources: EV-Volumes.com

Sales volume of plug-in electric vehicles in selected European countries in 2023 (in 1,000 units)

Electric vehicle sales in main European markets 2023



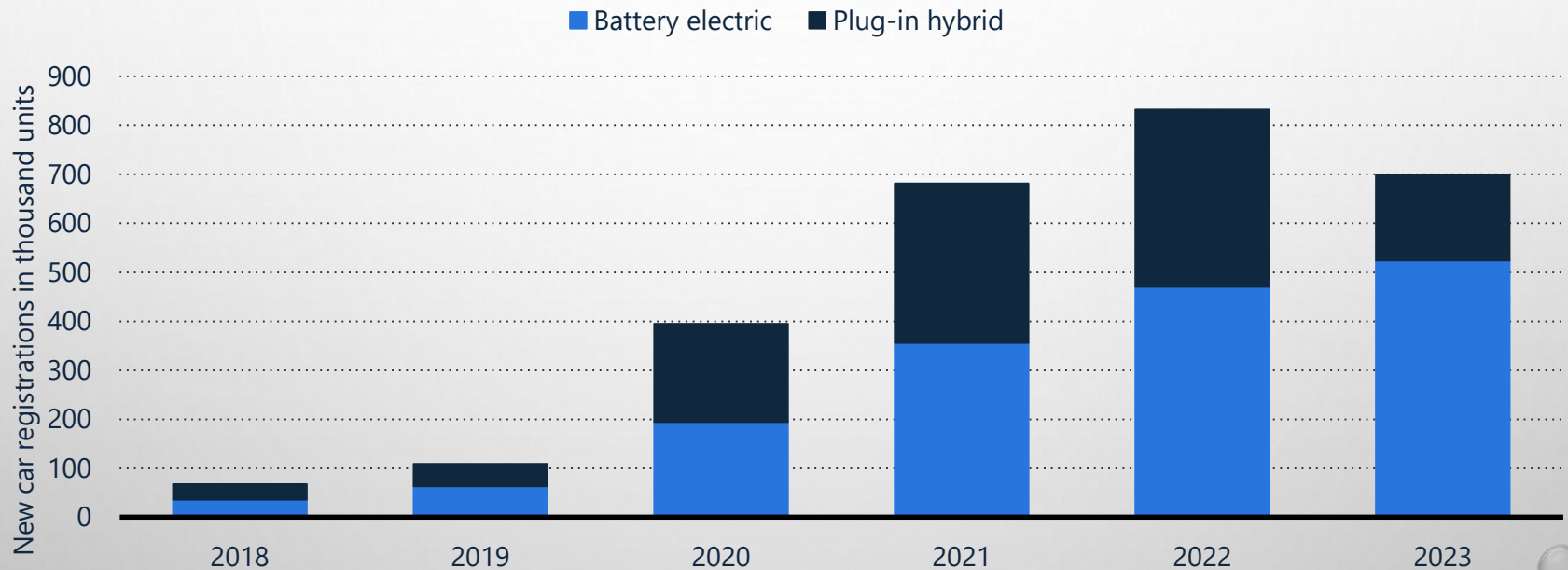
Note(s): Europe; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): Statista; ACEA; [ID 804772](#)

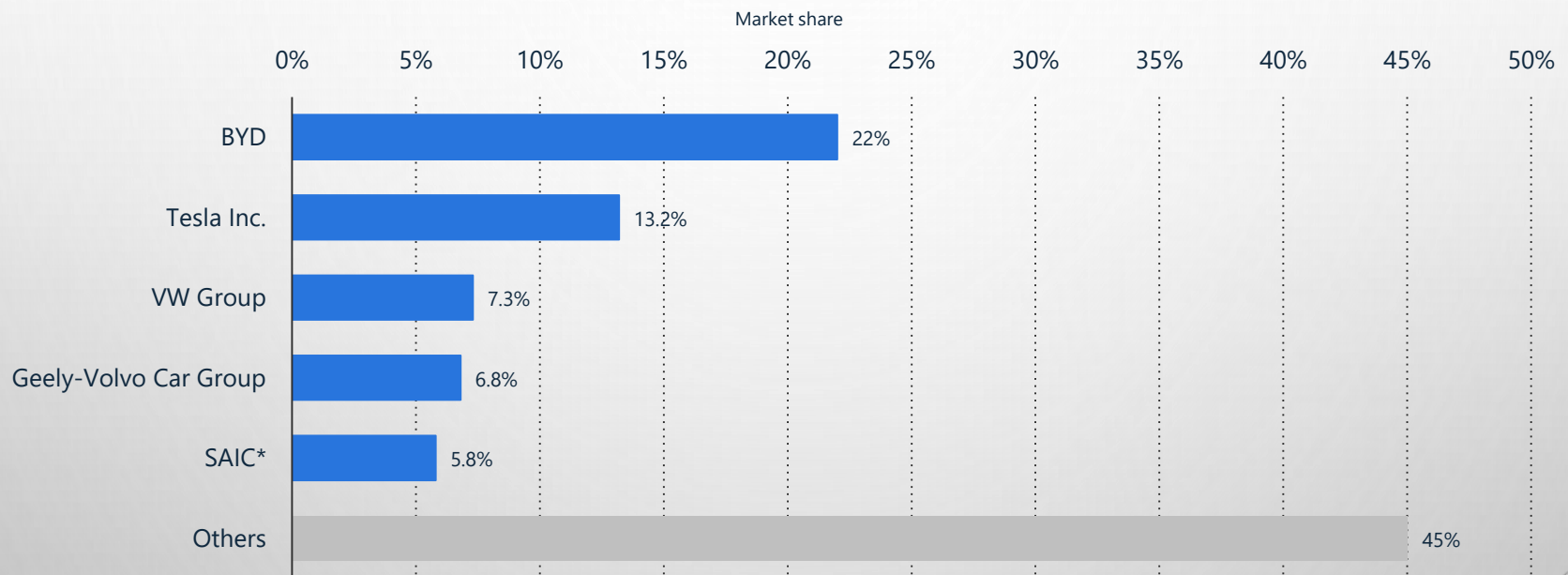
Plug-in electric car sales in Germany between 2018 and 2023 (in 1,000 units)

Germany: new plug-in electric car registrations 2018-2023



Global plug-in electric vehicle market share in 2023, by main manufacturer

Plug-in electric vehicle market share by manufacturer 2023



Note(s): Worldwide; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): EV-Volumes.com; Inside EVs; [ID_541390](#)

Leading plug-in hybrid electric vehicle models based on new registrations in Europe in 2023

Best-selling plug-in hybrid electric car models in Europe 2023



Note(s): Europe; 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): JATO; ID 1405979

SOLARNA OPSKRIBNA POSTAJA ZA AUTOMOBILE

Solarna opskrbna postaja za punjenje električnih vozila otvorena je u New Yorku



poziciju za punjenje može zauzeti električno vozilo od Mini-ja do BMW-a, iako je smještena u recikliranom utovarnom kontejneru.



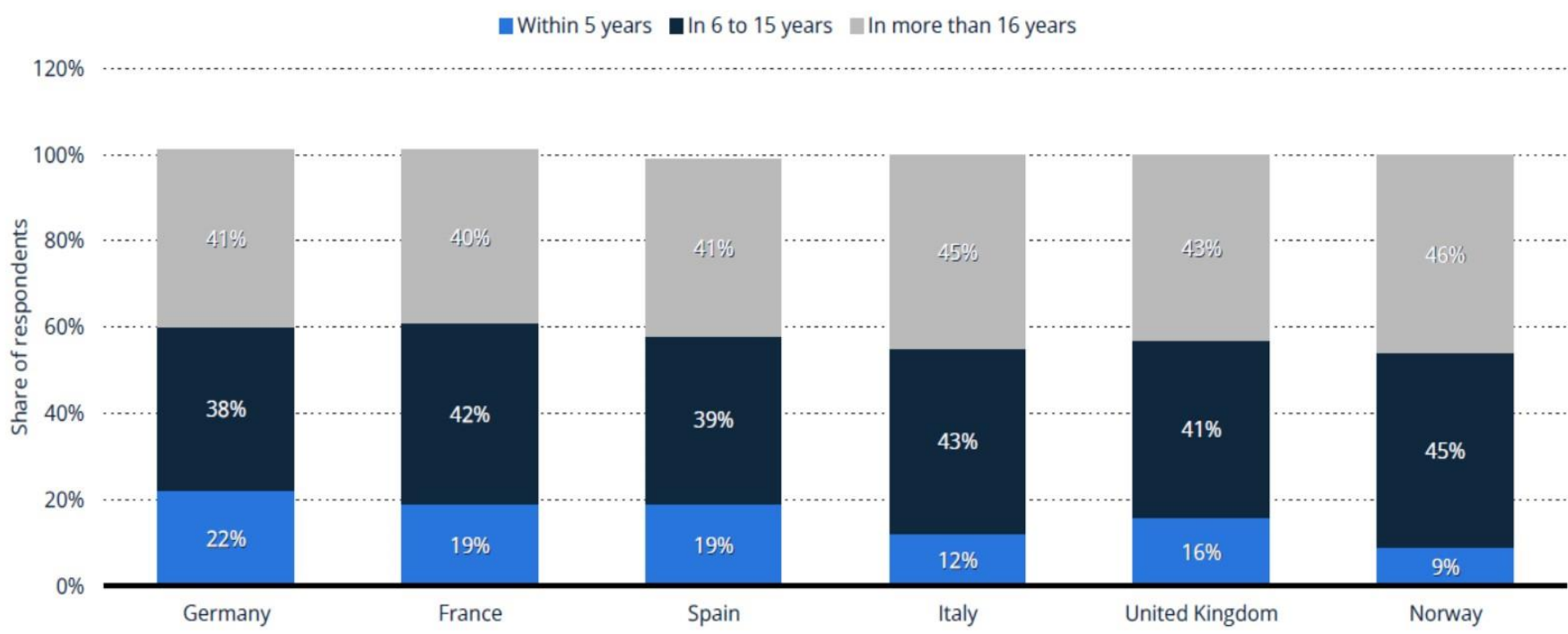
napaja preko 235W fotonaponskog sustava, punjenje traje oko 3 sata



Sl. 17-20. Solarna punionica

Consumer belief on the expected time of complete replacement of combustion vehicles by electric cars as of July 2023, by selected country

Europe: consumer belief on when electric cars will replace combustion vehicles



37 Description: In 2023, according to a survey conducted on consumer belief on the anticipated time of replacement of combustion vehicles by electric cars, the majority of survey participants expect it would take more than 16 years for electric cars to completely replace combustion vehicles. In Germany, 22 percent of the survey participants believe the complete replacement of combustion vehicles by electric cars will take place within five years. Norway was the country that had the lowest anticipation rate [...] [Read more](#)
Note(s): France, Germany, Italy, Norway, Spain, United Kingdom; June 28 to July 17, 2023; 7,000 respondents; 18-65 years
Source(s): C-ways; Harris interactive; Observatoire Cetelem; Toluna QuickSurveys

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- PITANJA??
 - HVALA NA PAŽNJI