



INTERVJU / INTERVIEW

MINISTAR GRAĐEVINARSTVA,
SAOBRAĆAJA I INFRASTRUKTURE

Goran Vesić

THE MINISTER OF CONSTRUCTION,
TRANSPORT AND INFRASTRUCTURE

RECIKLAŽA I BATERIJE za električna vozila

**RECYCLING and BATTERIES
for Electric Vehicles**

INTERVJU / INTERVIEW

OSNIVAČ I PREDSEDNIK OMR GRUPE

Ostoja Mijailović

THE FOUNDER AND PRESIDENT
OF THE OMR GROUP

INTERVJU / INTERVIEW

GENERALNI DIREKTOR KOMPANJE
GREEN ENERGY 360

Vladan Komatović

GENERAL MANAGER OF THE
GREEN ENERGY 360 COMPANY



EV REVOLUCIJA / EV REVOLUTION

E-VOZILA I OBNOVLJIVA ENERGIJA

E-Vehicles and Renewable Energy

CELEBRATING THE FUTURE

AGROSOLAR KULA

We celebrate the construction of the largest European agrosolar power plant and green energy for 200,000 households in Serbia by 2026.

SCAN THE QR CODE AND SEE THE FUTURE

40 YEARS  MK GROUP
THE BEST IS YET TO COME

Vaš partner za digitalni razvoj



Comtrade System Integration - spoj inovacije i tradicije, sa više od 25 godina iskustva u razvoju vrhunskih softverskih rešenja.

Uspešno vodimo kompanije i organizacije iz različitih industrija kroz proces digitalne transformacije, i za njih razvijamo proizvode prilagođene izazovima savremenog doba.





12 / 2023 / N° 04

GREEN NEWS**2024****06****INTERVJU**
Goran Vesić
INTERVIEW**14****E-vozila i obnovljiva energija**
E-Vehicles and Renewable Energy**28****INTERVJU**
Ostoja Mijailović
INTERVIEW**36****Skladištenje energije za električna vozila**

Energy Storage for Electric Vehicles

**46****INTERVJU**
Vladan Komatović
INTERVIEW**76****Bioekonomija kao put ka održivosti**

Bioeconomy as a Path to Sustainability

GLAVNI I
ODGOVORNI
UREDNIK
**Olivera
Krstić**
EDITOR IN CHIEF**Električna vozila****Electric Vehicles****REČ UREDNIKA****EDITOR WORDS****Dragi čitaoci,**

Uz zvuke novogodišnjih melodija, **Green News** sa ponosom predstavlja specijalno izdanje posvećeno revoluciji električnih vozila i njihovom ključnom uticaju na našu okolinu. U skladu sa našim ciljem promovisanja obnovljivih izvora energije i zaštite životne sredine, ovo izdanje je posvećeno istraživanju i probou električnih vozila kao ključnog faktora u održivoj budućnosti.

Imamo zadovoljstvo da vam predstavimo intervju sa vrhunskim stručnjacima čiji su napori usmereni ka transformaciji transporta i energije. Ministar građevinarstva, saobraćaja i infrastrukture deli svoje uvide o nacionalnim strategijama podrške infrastrukturi za električna vozila, dok generalni direktor kompanije Green Energy 360 osvetljava ključne poveznice između obnovljive energije i održive mobilnosti.

Takođe, istražujemo perspektivu Ostoje Mijailovića, osnivača i predsednika OMR grupe, koji deli svoje iskustvo, viziju i planove za dalji razvoj električnih vozila na našem tržištu.

Ovo izdanje posvećeno je inspiraciji, inovacijama i promenama koje električna vozila donose našem svetu. Nadamo se da će vam pružiti uvid u ključne faktore koji oblikuju budućnost transporta i podstaći vas da razmišljate o važnosti održive mobilnosti za našu planetu.

Srećni novogodišnji i božićni praznici i uživajte u čitanju!Srdačno,
Olivera Krstić**Dear Readers,**

To the tunes of New Year melodies, **Green News** proudly presents a special edition dedicated to the electric vehicle revolution and its pivotal impact on our environment. Aligned with our goal of promoting renewable energy sources and environmental protection, this issue delves into the exploration and breakthrough of electric vehicles as a key factor in a more sustainable future.

We take pleasure in introducing interviews with top experts whose efforts are directed towards transforming transportation and energy. The Minister of Infrastructure and Energy of Serbia shares insights into national strategies supporting electric vehicle infrastructure, while the CEO of Green Energy 360 sheds light on the crucial connections between renewable energy and sustainable mobility.

Furthermore, we explore the perspective of Ostoja Mijailović, founder and president of the OMR Group, who shares his experience, vision, and plans for further development of electric vehicles in our market.

This edition is dedicated to inspiration, innovation, and the changes electric vehicles bring to our world. We hope it provides you with insights into the key factors shaping the future of transportation and encourages you to contemplate the significance of sustainable mobility for our planet.

Merry Christmas & Happy New Year and enjoy the read!Warm regards,
Olivera Krstić**GREEN NEWS**

ISSN 3009-3678 IZLAZI JEDNOM MESEČNO

GLAVNI UREDNIK: **Olivera Krstić****GreenNews.rs**IZDAVAČ:
Green News doo
ADRESA:
Bul Zorana Đinđića 125i
11070 Novi Beograd
KONTAKT: office@greennews.rsREDAKCIJA:
Dejan Katalina
Bojana Lazarević
Maria Petrović
Maša RadulovićDIZAJN:

STORM DESIGN
+381 61 660 11 12
dusan.olujic@gmail.comFOTOGRAFIJE:
ShutterstockSTAMPA:
Birograf doo
Atanasije Pulje 22, 11080 Zemun
DISTRIBUTER:
PRETPLATA doo
+381 11 314 99 21 / office@pretplata.rs

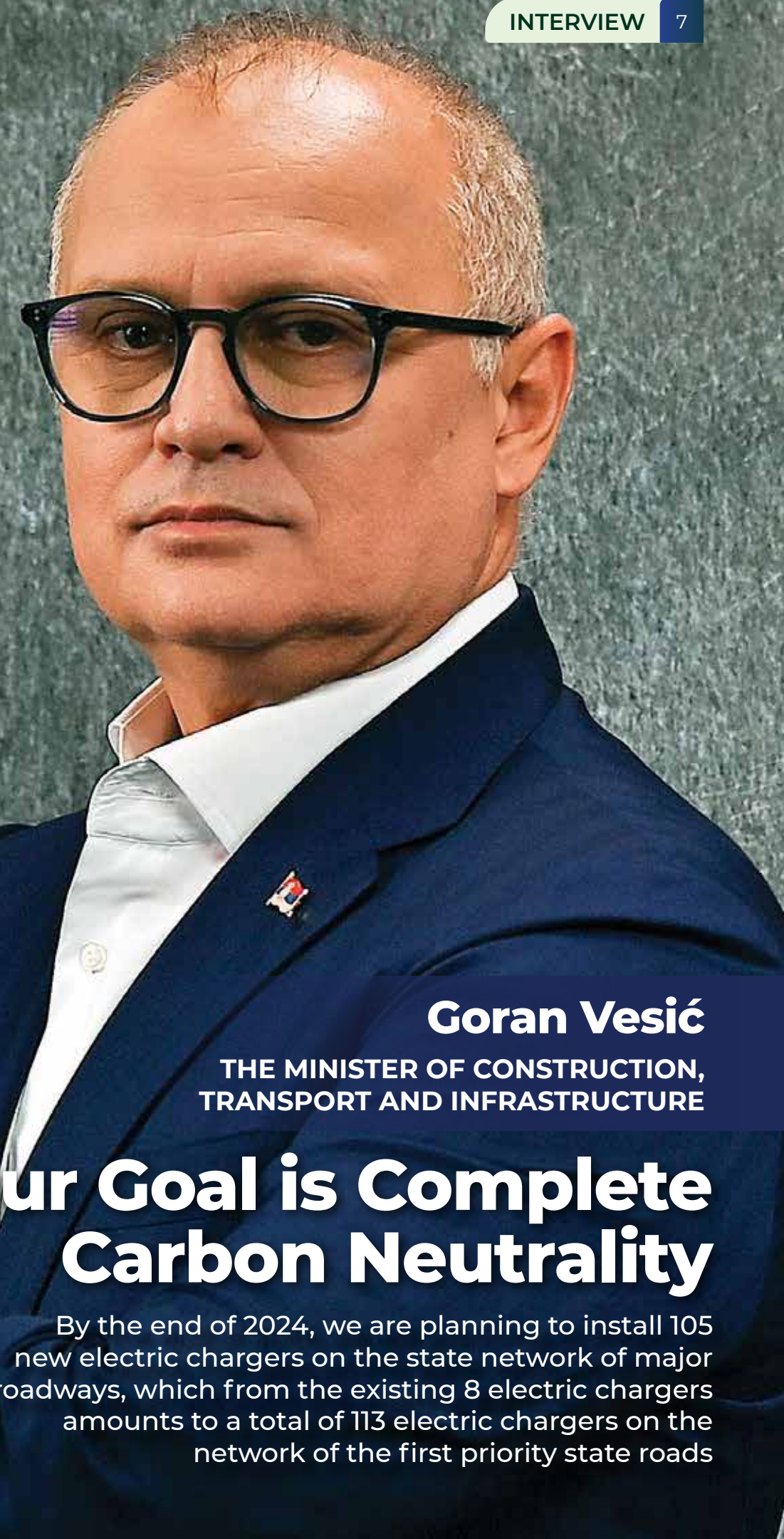
Goran Vesić



MINISTAR
GRAĐEVINARSTVA,
SAOBRAĆAJA I
INFRASTRUKTURE

Cilj nam je POTPUNA UGLJENIČNA NEUTRALNOST

Do kraja 2024. godine, planiramo da na državnoj mreži puteva prvog prioriteta bude instalirano 105 novih elektro punjača, što sa postojećih 8 elektro punjača iznosi ukupno 113 elektro punjača na mreži državnih puteva prvog prioriteta



Goran Vesić

THE MINISTER OF CONSTRUCTION,
TRANSPORT AND INFRASTRUCTURE

Our Goal is Complete Carbon Neutrality

By the end of 2024, we are planning to install 105 new electric chargers on the state network of major roadways, which from the existing 8 electric chargers amounts to a total of 113 electric chargers on the network of the first priority state roads

Goran Vesić

MINISTAR GRAĐEVINARSTVA, SAOBRAĆAJA I INFRASTRUKTURE



U Srbiji je trenutno registrovano više od 2.300.000 vozila, a učešće električnih vozila je oko 0,1 odsto, što je veoma malo učešće, tako da je realno očekivati značajniji rast

Električni automobili su budućnost i u tom smeru nas „guraju“ nove direktive i odluke iz Evropske unije vezane za plan potpune ugljenične neutralnosti i prestanka prodaje novih vozila sa unutrašnjim sagorevanjem, objašnjava u intervjuu za Green News Goran Vesić, ministar građevinarstva, saobraćaja i infrastrukture u Vladi Srbije.

GN *Ministarstvo građevinarstva, saobraćaja i infrastrukture pruža podršku razvoju električnih automobila u Srbiji. Koji su ključni koraci koje preduimate u vezi sa ovim progresom?*

- Ministarstvo građevinarstva, saobraćaja i infrastrukture opredelilo se za razvoj održivog transporta uključujući i razvoj i izgradnju neophodne infrastrukture i stanica za punjenje električnih vozila koje moraju biti javne i pristupačne svim korisnicima puta. Imajući u vidu ciljeve Zelene agende za

Zapadni Balkan, ali i evropske standarde, Ministarstvo građevinarstva, saobraćaja i infrastrukture zajedno sa JP „Putevi Srbije“ aktivno radi na modernizaciji putne mreže, ali i na uvođenju podsticaja za vozila sa nultom emisijom štetnih gasova kroz olakšice i umanjenja za električna vozila, kao što su besplatno punjenje na punjačima koji se nalaze na državnim putevima prvog prioriteta i umanjenje putarine za korisnike električnih vozila.

GN *U julu ove godine u Srbiji je registrovano za 20 odsto više električnih automobila nego u istom mesecu prošle godine. Koliko povećanje se može realno očekivati u bliskoj budućnosti?*

- Električni automobili su budućnost i u tom smeru nas „guraju“ nove direktive i odluke iz Evropske unije vezane za plan potpune ugljenične neutralnosti i prestanka prodaje novih vozila sa unutrašnjim

Goran Vesić

THE MINISTER OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE

More than 2,300,000 vehicles are currently registered in Serbia, and the share of electric vehicles is about 0.1 percent, which is a very small share, so it is realistic to expect significant growth



Electric cars are the future, and we are being „pushed“ in that direction by new directives and decisions from the European Union related to the plan for complete carbon neutrality and the cessation of sales of new vehicles with internal combustion, explains Goran Vesić, the Minister of Construction, Transport and Infrastructure in the Government of Serbia, in an interview for Green News.

GN *The Ministry of Construction, Transport and Infrastructure supports the development of electric cars in Serbia. What are key steps you are taking regarding this progress?*

- The Ministry of Construction, Transport and Infrastructure has opted for the development of sustainable transport, including the development and construction of the necessary infrastructure and charging stations for electric vehicles, which must be public and accessible to all road users. Bearing in mind the objectives of the Green Agenda for the Western Balkans, as well as European standards, the Ministry of Construction, Transport and Infrastructure, together with PE „Roads of Serbia“, is actively working on the modernization of the road network, but also on the introduction of incentives for vehicles with zero emission of harmful gases, such as free charging at chargers located on the first priority state roads, and toll reductions for the users of electric vehicles.

GN *In July 2023, 20 percent more electric cars were registered in Serbia than in the same month last year. How much increase can realistically be expected in the near future?*

- Electric cars are the future and we are being „pushed“ in that direction by new directives and decisions from the European Union related to the plan for complete carbon neutrality and the cessation of sales of new vehicles with internal combustion. Although Serbia is not a part of the EU, Serbia is strongly moving towards creating the conditions for the accelerated electrification of the fleet of cars in Serbia, as well as the conditions for foreign vehicles to increasingly use our roads, because Serbia is seriously committed to strengthening the infrastructure for the use of electric cars (electric chargers). This means that there are clear expectations that the sale of electric cars will be in constant growth, and that we are expected to have a significant share of electric cars in the fleet of cars in Serbia in the next 5 years. More than 2,300,000 vehicles are currently registered in Serbia, and the share of electric vehicles is about 0.1 percent, which is a very small share, so it is realistic to

expect a significant growth, which will be increasing year by year. According to data published by the European Automobile Manufacturers' Association (ACEA), sales of electric cars has increased by 62 percent at the European level. Slovenia, Bulgaria, Portugal, Belgium, Cyprus, Finland, and Greece have had the rise in sales of electric cars by more than 100 percent. In the German market, the growth of sales of electric vehicles in the first seven months is 37.2 percent, while in Turkey, for example, it has increased by almost 600 percent.

The data on the share of electric car sales in the total sales in the first 6 months of 2023 are interesting. It was about 9 percent in the USA, 33 percent in China, 35 percent in Germany, and even 90 percent in Norway. All these data show that the growth of sales of electric cars in Serbia is inevitable. There is also an announcement about the possible start and production of an electric car model in Serbia, which will also affect the increase of electric cars on our market.

GN *PE Roads of Serbia is looking for a financier who will invest in equipment that will be the property of the company. What has been the interest of potential investors so far?*

- The implementation of the project Green Stations is underway, within which PE Roads of Serbia, on the initiative and with the support of the Ministry of Construction, Transport and Infrastructure, is planning to equip 16 rest areas with 5 fast electric chargers (power 150 kW), and accompanying contents. The public call for the selection of financiers for the implementation of this project was published on October 10, 2023, and the opening of bids is scheduled for January 10, 2024. Domestic and foreign companies have expressed great interest, and they have already approached PE Roads of Serbia with various questions regarding the conditions for selecting financiers.

GN *What is the current state of the infrastructure for e-cars in the country and what initiatives are planned for its improvement?*

- Despite the fact that the Republic of Serbia is the leader in the region in terms of the availability of infrastructure for electric vehicles on public roads, we are aware that the number of electric chargers is still insufficient, taking into account the trends and development of this industry in Europe. The Republic of Serbia must satisfy the needs of its citizens as well as the needs required by the intensive transit traffic through our country. The development of road modernization necessarily includes the expansion of

Goran Vesić

MINISTAR GRAĐEVINARSTVA, SAOBRAĆAJA I INFRASTRUKTURE

U toku je realizacija projekta „Zelene stanice“, u okviru koga JP „Putevi Srbije“, na inicijativu i uz podršku Ministarstva građevinarstva, saobraćaja i infrastrukture, planira da opremi 16 odmorišta u Republici Srbiji sa po 5 brzih elektro punjača



sagorevanjem. Iako nije deo EU, Srbija snažno ide ka tome da stvori uslove za ubrzanu elektrifikaciju voznog parka u Srbiji, kao i uslove da strana vozila u sve većem obimu koristi naše puteve, jer se Srbija ozbiljno posvetila jačanju infrastrukture za korišćenje električnih automobila (elektropunjači). To govori da postoje jasna očekivanja da će prodaja električnih automobila biti u stalnom rastu i da se očekuje da u narednih 5 godina imamo značajnije učešće električnih automobila u voznom parku Srbije. U Srbiji je trenutno registrovano više od 2.300.000 vozila, a učešće električnih vozila je oko 0,1 odsto, što je veoma mali procenat, tako da je realno očekivati značajniji rast, koji će biti sve veći iz godine u godinu. Prema podacima koje je objavilo Udruženje evropskih proizvođača automobila ACEA prodaja električnih automobila se povećala za 62 odsto na nivou Evrope. Rast prodaje električnih automobila veći od 100 odsto imaju Slovenija, Bugarska, Portugal, Belgija, Kipar, Finska i Grčka. Na nemačkom tržištu, rast prodaje električnih vozila u prvih sedam meseci iznosi 37,2 procenta, dok na primer u Turskoj je povećano za skoro 600 odsto. Zanimljivi su podaci o učešću prodaje električnih automobila u ukupnoj prodaju u prvih 6 meseci 2023 godine, gde je u SAD-u bilo oko 9 odsto, u Kini 33 odsto, u Nemačkoj 35 odsto, a u Norveškoj čak 90 odsto. Svi ovi podaci govore da je neminovan rast prodaje električnih automobila i u Srbiji. Takođe, postoje i najave o mogućem početku i proizvodnji jednog modela električnog automobila u Srbiji, što će takođe uticati na povećanje broja električnih automobila na našem tržištu.

GN Putevi Srbije traže finansijera koji će uložiti u opremu koja će biti vlasništvo puteva. Kakvo je do sada interesovanje potencijalnih investitora?

- U toku je realizacija projekta „Zelene stanice“, u okviru koga JP „Putevi Srbije“, na inicijativu i uz podršku Ministarstva građevinarstva, saobraćaja i infrastrukture, planira da opremi 16 odmorišta u Republici Srbiji sa po 5 brzih elektro punjača (snage 150 kW) i pratećim sadržajima, na svakom odmorištu. Javni poziv za izbor finansijera za realizaciju ovog projekta je objavljen 10. oktobra 2023. godine, a otvaranje ponuda je zakazano za 10. januar 2024. godine. Iskazano je veliko interesovanje domaćih i stranih kompanija, koje su se već obraćale JP „Putevi Srbije“ sa različitim pitanjima u vezi uslova za odabir finansijera.

GN Kakvo je trenutno stanje infrastrukture za e-automobile u državi i koje su planirane inicijative za njeno unapređenje?

- I pored činjenice da je Republika Srbija lider u regionu po pitanju dostupnosti infrastrukture za električna vozila na javnim putevima, svesni smo da je broj elektro punjača ipak nedovoljan, uzimajući u obzir trendove i razvoj ove industrije u Evropi. Republika Srbija mora da zadovolji potrebe kako svojih građana, tako i potrebe koje zahteva intenzivan tranzitni saobraćaj kroz našu zemlju. Razvoj putne modernizacije obavezno uključuje i širenje mreže elektro punjača na državnim putevima, na čemu Ministarstvo intenzivno radi u saradnji sa upravljačem javnih puteva.

GN Stanice za punjenje baterija postavljene su na putevima Srbije, ali u nedovoljnom broju. Na koji način Ministarstvo planira da reši izazove u vezi sa njihovim porastom?

- Postavljanje javnih elektro punjača na državnim putevima prvog prioriteta je započelo još 2017. godine. JP „Putevi Srbije“ trenutno upravlja sa osam elektro punjača na ključnim tačkama na autoputevima, odnosno na ulazima u Republiku Srbiju i to na naplatnim stanicama „Preševo“, „Šid“, „Dimitrovgrad“, „Subotica“, kao i na odmorištu Boljkovci na autoputu „Miloš Veliki“ (smer Beograd-Čačak).

U toku je sprovođenje projekta instalacije novih 10 brzih elektro punjača na putevima IA reda. Planirano puštanje u rad ovih punjača je april 2024. godine.

JP „Putevi Srbije“ u saradnji sa resornim ministarstvom ima nameru da nove deonice autoputeva takođe oprema električnim punjačima. Na deonicama puteva IA reda u izgradnji- „Moravski koridor“ i Ruma-Šabac, do kraja 2024. godine, predviđeno je postavljanje 15 brzih elektro punjača (9 elektro punjača u 2023. godini, a 6 elektro punjača u 2024. godini). Navedeni punjači će imati snagu 100-120 kW.

Do kraja 2024. godine, planiramo da na državnoj mreži puteva prvog prioriteta bude instalirano 105 novih elektro punjača, što sa postojećih 8 elektro punjača iznosi ukupno 113 elektro punjača na mreži državnih puteva prvog prioriteta.

GN Možete li nam reći nešto više o programima i podsticajima za građane i firme koji razmatraju prelazak na e-automobile?

- Ministarstvo građevinarstva, saobraćaja i infrastrukture, zajedno sa upravljačem javnih puteva ima nameru da elektro punjači budu deo putne infrastrukture u skladu sa pozitivnim svetskim trendovima. Shodno tome, ova usluga je sada besplatna za korisnike, čime želimo da damo doprinos oživljavanju i razvoju transporta električnih vozila u



Goran Vesić

MINISTAR GRAĐEVINARSTVA, SAOBRAĆAJA I INFRASTRUKTURE



Republici Srbiji. Troškove električne energije u ovom trenutku snosi JP „Putevi Srbije“, a kada se steknu zakonski uslovi, biće uvedena naplata punjenja za korisnike. Na inicijativu JP „Putevi Srbije“ i Ministarstva građevinarstva, saobraćaja i infrastrukture, izmenjen je Zakon o naknadama za korišćenje javnih dobara u pogledu ostvarivanja popusta na plaćanje putarine za korisnike električnih vozila (do 13 odsto), čime ćemo dodatno subvencionisati i promovisati ovaj vid transporta. Korisnici električnih vozila ovaj popust će moći da ostvare od 01.01.2024, odnosno nakon donošenja podzakonskog akta koji bliže uređuje način ostvarivanja prava na popust.

GN Eksploatacija e-vozila dovodi do baterijskog otpada. Kako se Ministarstvo suočava sa izazovom njihove reciklaže?

- Upravljanje bilo kojim otpadom, pa i ovim električnim i elektronskim (baterijskim otpadom) je regulisano Zakonom o upravljanju otpada. S obzirom na zastupljenost električnih automobila, trenutno nema problema sa baterijskim otpadom. Međutim, jasno je da će baterijski otpad tek biti veliki problem, s obzirom na razvoj električnih automobila i životni vek baterija i da nam tek predstoji ozbiljnije regulisanje ove oblasti. Imajući u vidu da baterijski otpad ima vrednost, i da se primenom adekvatnih tehnologija recikliranja, delovi otpada mogu ponovo koristiti, logično se nameće da će se problem istrošenih baterija rešavati preko reciklažnih centara. Za sada se svega pet do deset odsto litijum-jonskih baterija u svetu reciklira, a vodeće automobilske kompanije,

uveliko rade na razvijanju tehnologije za recikliranje i otvaraju postrojenja za tu namenu, s obzirom da je sirovina za proizvodnju baterija skupa. Reciklaža je veoma skup postupak, ali usavršavanjem tehnologije recikliranja sigurno će ovaj proces dovesti na nivo isplativosti. Realno je očekivati da će se ovaj problem rešavati globalno i da ćemo mi biti deo globalnog rešenja a da će nosioci reciklaže biti proizvođači baterija ili proizvođači električnih automobila. Problematika reciklaže i upravljanje otpadom je u nadležnosti Ministarstva zaštite životne sredine.

GN Koji su dugoročni ciljevi za budućnost e-automobila u Srbiji, uključujući očekivanja u vezi sa tržištem i tehnološkim inovacijama?

- S obzirom da su električni automobili budućnost, da smo deo globalnog tržišta automobila i deo evropske mreže puteva i da u skladu sa tim moramo imati iste ciljeve kao i okruženje, moramo se prilagođavati tržištu i pratiti tehnološke inovacije u ovoj oblasti, što znači, da imamo cilj za dostizanje plana potpune ugljenične neutralnosti. Da bi smo ovo postigli, neophodan je stalni razvoj infrastrukture za korišćenje električnih automobila, koji mora da dostigne nivo razvijenijih zemalja Evrope. Da bi se olakšala kupovina električnog automobila, neophodno je redovno obezbeđivati finansijski podsticaj kroz davanje raznih subvencija i različitih privilegija za korišćenje električnih automobila kako bi se time omasovila njihova prodaja.

GN

Goran Vesić

THE MINISTER OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE

The implementation of the project to install 10 new fast electric chargers on roads of the first A order is underway



the network of electric chargers on state roads, which the Ministry is intensively working on in cooperation with the manager of public roads.

GN Charging stations for batteries have been installed on the roads of Serbia, but their number is insufficient. How does the Ministry plan to solve the challenges related to their increase?

- The installation of public electric chargers on the first priority state roads began in 2017. PE Roads of Serbia is currently managing eight electric chargers at key points on highways, i.e. at ports of entry to the Republic of Serbia, namely at toll stations Preševo, Šid, Dimitrovgrad, Subotica, as well as at the rest area Boljkovci on highway Miloš Veliki (direction Belgrade-Čačak).

The implementation of the project to install 10 new fast electric chargers on the first A roads is underway. The planned start-up of these chargers is April 2024.

PE Roads of Serbia in cooperation with the ministry in charge intends to equip new sections of highways with electric chargers as well. By the end of 2024, it is planned to install 15 fast electric chargers (9 electric chargers in 2023, and 6 electric chargers in 2024) on road sections of the first A order roads under construction - Moravski Corridor and Ruma-Šabac. The specified chargers will have a power of 100-120 kW.

By the end of 2024, we are planning to install 105 new electric chargers on the state network of the first priority roads, which from the existing 8 electric chargers amounts to a total of 113 electric chargers on the network of the first priority state roads.

GN Can you tell us more about the programs and incentives for citizens and businesses considering the transition to e-cars?

The Ministry of Construction, Transport and Infrastructure, together with the manager of public roads, intends to install electric chargers as part of the road infrastructure in accordance with positive world trends. Consequently, this service is now free for users, which is how we want to contribute to the revival and development of electric vehicle transport in the Republic of Serbia. Electricity costs are currently borne by PE Roads of Serbia, and when legal conditions are met, charging for users will be introduced. At the initiative of PE Roads of Serbia and the Ministry of Construction, Transport and Infrastructure, the Law on Charges for the Use of Public Goods has been amended in terms of discounts on the payment of tolls for users of electric vehicles (up to 13 percent), which will further subsidize and promote this form of transport. The users of electric vehicles will be able to obtain this discount from January 1, 2024, i.e. after the

adoption of a by-law that regulates more closely the way of realising the right to the discount.

GN The exploitation of e-vehicles leads to battery waste. How does the Ministry face the challenge of their recycling?

- The management of any kind of waste, including this electrical and electronic (battery waste), is regulated by the Law on Waste Management. Given the prevalence of electric cars, there is currently no problem with battery waste. However, it is clear that the problem of battery waste will be a big one, considering the development of electric cars and the lifespan of batteries, and that we are yet to have a more serious regulation of this area. Given that battery waste has value, and that by applying adequate recycling technologies parts of the waste can be reused, it is logical that the problem of used batteries will be solved through recycling centers. For now, only five to 10 percent of lithium-ion batteries in the world are recycled, and leading car companies are working hard to develop recycling technology and open facilities for that purpose, given that the raw material for the production of batteries is expensive. Recycling is a very expensive process, but improving recycling technology will certainly bring this process to the level of profitability. It is realistic to expect that this problem will be solved globally and that we will be part of the global solution, and that the carriers of recycling will be battery manufacturers or electric car manufacturers. The issue of recycling and waste management is the responsibility of the Ministry of Environmental Protection.

GN What are the long-term goals for the future of e-cars in Serbia, including expectations regarding the market and technological innovations?

- Considering that electric cars are the future, that we are part of the global car market and part of the European road network, and that we must accordingly have the same goals as the environment, we must adapt to the market and follow technological innovations in this area, which means that we have the goal of reaching a plan of complete carbon neutrality. In order to achieve this, it is necessary to constantly develop the infrastructure for the use of electric cars, which must reach the level of more developed countries in Europe. In order to facilitate the purchase of electric cars, it is necessary to regularly provide financial support through the provision of various subsidies and the granting of various privileges for the use of electric cars in order to sell them massively.

GN

E-Vehicles and Renewable Energy PERFECT MATCH



Korporativna nabavka obnovljive energije putem bilateralnih ugovora o kupovini električne energije dovela je do značajne dobrovoljne potražnje za novim projektima širom sveta

E-vozila i obnovljiva energija SAVRŠEN PAR



Corporate procurement of renewable energy through bilateral power purchase agreements has led to significant voluntary demand for new projects around the world

Električnim vozilima potrebno je između 24 i 50 kWh električne energije da bi prešla 160 kilometara, a ova struja dolazi iz mreže

Electric vehicles need between 24 and 50 kWh of electricity to travel 160 kilometers, and this electricity comes from the grid



EV revolucija je pred nama. Zapravo, već se uveliko dešava, mada ne u jednakoj meri svuda u svetu. Prema Međunarodnoj agenciji za energiju (IEA), broj putničkih vozila na električni pogon bi na svetskim putevima mogao da premaši 250 miliona do 2030. godine, dok Međunarodna agencija za obnovljivu energiju (IRENA) procenjuje da bi električni autobusi i druga vozila za masovni tranzit mogla da premaše brojku od 10 miliona. Pošto imaju električni motor, umesto motora sa unutrašnjim sagorevanjem, e-vozila ne emituju izduvne gasove iz izduvne cevi, što znači da, za razliku od tradicionalnih vozila, ne pumpaju ugljen-dioksid, ozon i čestice zagađenja u vazduh koji udišemo.

Ovo je izuzetno važno, jer transport čini oko jedne petine globalnih emisija, a putovanje drumom čini tri četvrtine te količine. Najveći deo ovog iznosa dolazi od putničkih vozila – automobila i autobusa – koji učestvuju sa 45,1 odsto. Ostalih 29,4 odsto dolazi od kamiona koji prevoze teret. Kako tvrde upućeni, ova brojka će se samo povećavati kako vreme prolazi, jer rast stanovništva i demografske promene podstiču sve veću potražnju za putovanjima. S obzirom na to da Svetska zdravstvena organizacija (SZO) procenjuje da zagađenje vazduha uzrokuje svaki deveti smrtni slučaj širom sveta, transformacija naše globalne transportne matrice - u onu kojom upravljaju e-vozila - maltene bi garantovala sigurniju i zeleniju budućnost za sve.



The EV revolution is ahead of us. In fact, it is already happening in a big way, although not to the same extent everywhere in the world. According to the International Energy Agency (IEA), the number of electric passenger vehicles on the world's roads could exceed 250 million by 2030, while the International Renewable Energy Agency (IRENA) estimates that electric buses and other mass transit vehicles could exceed the figure of 10 million. Since they have an electric motor, instead of an internal combustion engine, e-vehicles do not emit exhaust gases from the exhaust pipe, which means that, unlike traditional vehicles, they do not pump carbon dioxide, ozone and particulates of pollution into the air we breathe.

This is extremely important, as transport accounts for about one-fifth of global emissions, and road travel accounts for three-quarters of that amount. The largest part of this amount comes from passenger vehicles - cars and buses - which account for 45.1 percent. The other 29.4 percent comes from trucks carrying cargo. According to knowledgeable persons, this figure will increase as time goes on, as population growth and demographic changes encourage ever-increasing demand for travel. With the World Health Organization (WHO) estimating that air pollution causes one in nine deaths worldwide, transforming our global transport matrix - to one driven by e-vehicles - would surely guarantee a safer and greener future for all.

Transport

čini oko jedne petine globalnih emisija, a putovanje drumom čini tri četvrtine te količine

Transport
accounts for about one-fifth of global emissions, with road travel accounting for three-quarters of that amount



PRLJAVA ILI ČISTA ENERGIJA

Električnim vozilima je potrebno između 24 i 50 kWh električne energije da bi prešla 160 kilometara, a ova struja dolazi iz mreže. Sa studijom američkog Ministarstva energetike koja pokazuje da će povećana elektrifikacija povećati nacionalnu potrošnju za čak 38% do 2050. godine, velikim delom zbog električnih vozila, u nekim slučajevima bi ova vozila mogla dovesti do značajnih emisija gasova staklene bašte ili čak pomoći u produžavanju životnog veka fosilnih goriva, ako se napajaju prvenstveno energijom iz fosilnih goriva. U stvari, nedavna studija kineskog univerziteta Tsinghua otkrila je da električna vozila koja se naplaćuju u Kini - gde većina električne energije dolazi iz elektrana na uglj - doprinose dva do pet puta više čestica i hemikalija u odnosu na automobile na gas.

U suštini, osim ako električna energija koja napaja EV nije čista, EV nikada ne mogu biti potpuno zelena opcija. Sa ogromnim brojem električnih vozila za koje se predviđa da će se pojaviti na mreži u narednim godinama, ključno je da i korisnici i komunalna preduzeća pronađu način da ih „napune“

obnovljivim izvorima energije. Zaista, istina je da električna vozila mogu biti ključ za povezivanje sektora obnovljive energije i niskouglednog transporta, za dobrobit svih.

VIŠE OBNOVLJIVIH KAPACITETA ŠIROM SVETA

Do 2030. godine, količina električne energije, potrebna za napajanje svih električnih vozila, biće čak 640 TWh. Ako to stavimo u ovu perspektivu, više od 300 globalnih korporacija koje su potpisale RE100 (javni dogovor koji osigurava 100 odsto elektrifikaciju iz obnovljivih izvora) - obećavaju da će kupovati 100 odsto obnovljive izvore u ukupnom iznosu od oko 220 TWh godišnje - ili nešto više od trećine te količine. To dalje stvara veliku priliku za pozicioniranje električnih vozila kao jednog od najvećih kupaca obnovljive električne energije na globalnom nivou. I ne samo to, već bi i potrebe za električnom energijom električnih vozila mogle da se iskoriste, kako bi se pokrenulo uvođenje više obnovljivih kapaciteta širom sveta.



DIRTY OR CLEAN ENERGY

Electric vehicles need between 24 and 50 kWh of electricity to travel 160 kilometers, and this electricity comes from the grid. With a US Department of Energy study showing that increased electrification will increase national consumption by as much as 38% by 2050, in large part due to electric vehicles, in some cases these vehicles could lead to significant greenhouse gas emissions or even help extend the life of fossil fuels, if powered primarily by energy from fossil fuels. In fact, a recent study by China's Tsinghua University has found that electric vehicles charged in China - where most electricity comes from coal-fired power plants - contribute two to five times more particulates and chemicals to the compared gas cars.

Basically, unless the electricity powering an EV is clean, EVs can never be a fully green option. With a huge number of electric vehicles predicted to appear on grid in the coming years, it is crucial that both consumers and utility companies find a way to „charge“ them with renewable energy sources.

Indeed, it is true that electric vehicles can be the key to connecting the renewable energy and low-carbon transport sectors, for the benefit of all.

MORE RENEWABLE CAPACITY AROUND THE WORLD

By 2030, the amount of electricity needed to power all electric vehicles will be as much as 640 TWh. If we put it in this perspective, more than 300 global corporations that have signed RE100 (a public agreement to ensure 100 percent electrification from renewable resources) - promise to buy 100 percent renewables totaling around 220 TWh per year - or just over a third of that amount. This further creates a great opportunity to position electric vehicles as one of the largest buyers of renewable electricity globally. Not only that, but the electricity needs of electric vehicles could also be used in order to drive the introduction of more renewable capacity around the world.

The model, in fact, already exists. Corporate procurement of renewable energy through bilateral



Model, zapravo, već postoji. Korporativna nabavka obnovljive energije putem bilateralnih ugovora o kupovini električne energije (PPA) dovela je do značajne dobrovoljne potražnje za novim projektima obnovljive energije širom sveta. Prošle godine, korporacije su kupile rekordnih 23,7 GW čiste energije, u odnosu na 20,1 GW u 2019. i 13,6 GW u 2018, prema novom istraživanju koje je objavio BloombergNEF (BNEF). Možda posebno iznenađuje što se ovaj preokret desio uprkos poremećajima izazvanim kovidom-19 i globalnom recesijom.

Kroz PPA, proizvođači originalne opreme za vozila (OEM), operateri punjača, dobavljači usluga električne mobilnosti i sve veći broj kompanija koje se obavezuju da će svoje vozne parkove prebaciti na EV – imaju priliku da razviju gotovo besprekorna zelena rešenja za budućnost, kao i da olakšaju razvoj novih projekata obnovljive energije – što će, zauzvrat, približiti svet ispunjavanju ciljeva Pariskog sporazuma.



power purchase agreements (PPAs) has led to significant voluntary demand for new renewable energy projects worldwide. Last year, corporations bought a whopping 23.7 GW of clean energy, compared to 20.1 GW in 2019, and 13.6 GW in 2018, according to new research released by BloombergNEF (BNEF). Perhaps particularly surprising is that this turnaround has occurred despite the disruptions caused by Covid-19 and the global recession.

Through PPAs, vehicle original equipment manufacturers (OEMs), charging station operators, electric mobility service providers and the growing number of companies committing to transitioning their fleets to EVs – have the opportunity to develop near-seamless green solutions for the future, as well as to facilitate the development of new renewable energy projects – which, in turn, will bring the world closer to achieving the goals of the Paris Agreement.



Elnos Grupa - vaš internacionalni partner za elektroenergetiku!

Poslujući u 17 zemalja, postavljamo standarde širom Evrope. Naš doprinos od 1.200 MW iz obnovljivih izvora energije, uz preko 800 MW u realizaciji, čini nas jednim od lidera u OIE sektoru.

Elnos Group - your international partner in electrical engineering!

Operating in 17 countries, we are setting standards across Europe. Our contribution of 1,200 MW from renewable energy sources, along with over 800 MW in progress, positions us as one of the leader in RES sector.



Posetite nas na www.elnosgroup.com i zajedno oblikujmo energetska budućnost.
Visit us at www.elnosgroup.com let's shape the energy future together.

5 RAZLOGA ZA ODABIR ELEKTRIČNIH VOZILA



Dugo se pitate da li vam treba električni automobil? Ako ste u nedoumici, predstavljamo vam pet uverljivih razloga zašto treba da razmislite o upotrebi ovih vozila. EV (električna vozila) donose brojne prednosti koje će poboljšati svakodnevnu rutinu, finansije i doprineti očuvanju okoline.

Promenite svoj pogled na vožnju - razmislite o prelasku na EV i iskusite sve njegove prednosti.



Have you been wondering for a long time whether you need an electric car? If you are in doubt, here are five convincing reasons why you should consider using these vehicles. EVs (electric vehicles) bring a number of advantages that will improve the daily routine, finances and contribute to the preservation of the environment.

Change the way you look at driving - consider switching to an EV and experience all its benefits.

5 REASONS

FOR CHOOSING ELECTRIC VEHICLES



Dajemo vam nekoliko odličnih argumenata koji objašnjavaju zašto je vožnja električnih vozila sve popularnija i isplativija opcija za vas



We give you some convincing reasons that explain why driving an electric vehicle is an increasingly popular and cost-effective option for you

POVEĆANJE POGODNOSTI

Zaboravite redove na benzinskim stanicama i dugotrajna čekanja. Povoljnije je punjenje baterija vašeg vozila kod kuće ili koristeći mrežu javnih punjača. U nekim državama, vozači ovih automobila imaju privilegiju da koriste trake za popunjenost vozila (HOV/carpool), što štedi vreme i nerviranje tokom putovanja.

EKONOMIČNIJA VOŽNJA

Električna energija znatno je jeftinija od benzina, što predstavlja uštedu na gorivu. Električni motori su izrazito efikasniji od konvencionalnih motora sa unutrašnjim sagorevanjem, omogućavajući visoke kilometarske ocene. Dodatnu uštedu postizete odabirom povoljnih tarifa za punjenje EV kod kuće i pametnim rasporedom punjenja tokom noćnih sati.

MANJE ODRŽAVANJA

Održavanje vozila je ključno za njegovo dugoročno zdravlje. EV zahtevaju znatno manje održavanje jer imaju manje pokretnih delova u odnosu na vozila sa unutrašnjim sagorevanjem. To znači manje briga i zakazanih obaveza potrebnih za servisiranje.

INCREASING BENEFITS

Forget queues at gas stations and long waits. It is more convenient to charge your vehicle's batteries at home or using a network of public chargers. In some countries, drivers of these cars have the privilege of using HOV/carpool lanes, which saves time and hassle during travel.

MORE ECONOMICAL DRIVING

Electricity is significantly cheaper than petrol, which means savings on fuel. Electric motors are markedly more efficient than conventional internal combustion engines, enabling high mileage ratings. You achieve additional savings by choosing favorable tariffs for charging EVs at home, and by smartly scheduling the charging during the night hours.

LESS MAINTENANCE

Vehicle maintenance is critical to its long-term health. EVs require significantly less maintenance because they have fewer moving parts compared to internal combustion vehicles. This means fewer worries and less appointments required for the servicing.



SUBVENCije ZA KUPOVINU EV

Nabavka električnog vozila može biti isplativija nego što mislite. Vlade mnogih država nude subvencije za kupovinu EV, što značajno smanjuje ukupne troškove, u vidu povrata poreza na novo *plug-in* vozilo kao i nešto manje povrate za polovna vozila.

Dizajn mnogih električnih automobila kombinuju futurističke elemente i ekološku svest

STATUS IDE UZ ELEKTRIČNU VOŽNJU

Vožnja EV-ja nije samo praktična odluka, već i izjava vašeg odnosa prema okolini. Dizajn mnogih električnih automobila kombinuju futurističke elemente i ekološku svest. Vaši prijatelji primetiće da vozite električno vozilo, što donosi pozitivan status i doprinosi očuvanje planete.



SUBSIDIES FOR THE PURCHASE OF EVS

Getting an electric vehicle can be more cost-effective than you think. Governments of many countries offer subsidies for the purchase of EVs, which significantly reduces the overall cost, in the form of tax refunds on new *plug-in* vehicles as well as slightly smaller refunds for used vehicles.

The design of many electric cars combines futuristic elements and environmental awareness

STATUS GOES WITH ELECTRIC DRIVING

Driving an EV is not only a practical decision, but also a statement of your attitude towards the environment. The design of many electric cars combines futuristic elements and environmental awareness. Your friends will notice that you drive an electric vehicle, which brings positive status and contributes to the protection of the planet.



OMR[®]

GROUP

Ostoja Mijailović

THE FOUNDER AND PRESIDENT
OF THE OMR GROUP

Ostoja Mijailović

OSNIVAČ I PRESEDNIK OMR GRUPE

E-MOBILNOST JE BUDUĆNOST koja će do korisnika doći kroz biznis sektor

U ovom trenutku e-mobilnost već prihvataju i kompanije jer za tako nešto postoji ekonomska osnova, a kompanije to lako izračunaju kada uporede dobit i troškove

E-Mobility is the Future That Will Reach Users Through the Business Sector

Ostoja Mijailović

OSNIVAČ I PREDSEDNIK OMR GRUPE



Moramo mnogo raditi na edukaciji korisnika, jer ljudi imaju zadržku prema električnim vozilima pre svega zbog logističkih pitanja

Uvek će biti ljudi koji vole automobile na benzin ili dizel, koji uživaju u zvuku motora i mirisu goriva, ali sam isto tako siguran da će biti i sve više onih koji će na prvo mesto stavljati ekonomsku isplativost i ekološku održivost, kaže u intervjuu za Green News Ostoja Mijailović, osnivač i predsednik OMR grupe.

GN *Od 2,3 miliona registrovanih automobila u Srbiji, svega nešto preko 1.700 komada su električni automobili, dok sa hibridima taj broj dolazi do takođe zanemarljivih 17.000 vozila. Šta su prepreke da se srpsko tržište u većoj meri okrene ka e-mobilnosti?*

- Električni automobili su novina na našem tržištu i klijenti ih u velikoj meri još uvek tako percipiraju. Kao nešto novo, nedovoljno istraženo, nedovoljno potvrđeno, sa infrastrukturom koja još uvek ne pruža željenu podršku. Ipak, stvari se ubrzano menjaju i mi se sada nalazimo na kraju tog perioda kada se za električna vozila interesuju samo premium kupci, ljudi koji vole inovativnost, ekskluzivnost i prestiž, i koji su spremni da za to plate. U ovom trenutku e-mobilnost već prihvataju i kompanije jer za tako nešto postoji ekonomska osnova, a kompanije to lako izračunaju kada uporede dobit i troškove. Imamo već primere kurirskih službi, komercijalnih službi koje

imaju dnevnu dostavu unutar 200 kilometara, tu je i „Pošta Srbije“. Svi oni polako prelaze na električna vozila jer im se više isplati. Ono što će biti zanimljivo jeste sledeći korak, a to je da električna vozila prihvate fizička lica. Do sada je veliku ulogu za fizička lica igrala cena, ali biće zanimljivo da vidimo reakciju tržišta kada dobijemo „električnu pandu“ iz Fijata u Kragujevcu koja bi trebala da košta ispod 20.000 evra. Paralelno sa tim, širi se mreža sporih i brzih punjača, dok se radi i na dodatnom informisanju korisnika kada je u pitanju kućno punjenje, jer je ono slično onome kada uveče punite vaš mobilni telefon.

GN *Ipak, utisak je da se ljudi i dalje „plaše“ električnih vozila?*

- Moramo mnogo raditi na edukaciji korisnika, jer ljudi imaju zadržku prema električnim vozilima pre svega zbog logističkih pitanja. Boje se da neće imati gde da napune bateriju ili da će ostati „na putu“. Ali već sada imamo dovoljno solucija za svaku vrstu korisnika. Građani svoje automobile pune kod kuće ili na poslu, kompanije u svojim dvorištima, a svi na sve većem broju javnih punjača na putevima, u tržnim centrima, hotelima, restoranima... U kombinaciji svega ovoga ljudi bez straha mogu da koriste svoje vozilo. Mi u okviru OMR Grupe zastupamo vrhunske proizvođače

Ostoja Mijailović

THE FOUNDER AND PRESIDENT OF THE OMR GROUP

At the present moment, e-mobility is already accepted by companies because there is the economic basis for it, and the companies can easily calculate this when they compare profit and costs



There will always be people who like petrol or diesel cars, who enjoy the sound of the engine, and the smell of fuel, but I am also sure that there will be more and more people who will prioritize economic profitability and environmental sustainability, says Ostoja Mijailović, the founder and president of the OMR Group, in an interview with Green News.

GN *Of 2.3 million registered cars in Serbia, just over 1,700 are electric cars, while with hybrids, that number reaches negligible 17,000 vehicles. What are obstacles for the Serbian market to turn more towards e-mobility?*

- Electric cars are a novelty on our market, and to a large extent clients still perceive them as such - something new, insufficiently researched and confirmed, with an infrastructure that still does not provide the desired support. However, things are changing rapidly, and we are now at the

end of the period when only premium customers are interested in electric vehicles, people who like innovation, exclusivity and prestige, and who are ready to pay for it. At the present moment, e-mobility is already accepted by companies because there is the economic basis for it, and the companies can easily calculate this when they compare profit and costs. We already have examples of courier services, commercial services that have daily delivery within 200 kilometers, there is also the Post of Serbia. All of them are slowly switching to electric vehicles because it is more profitable for them. The next step will be interesting, and that is the acceptance of electric vehicles by individuals. So far, the price has played a big role for them, but it will be interesting to see the reaction of the market when we get the „electric panda“ from Fiat in Kragujevac, which should cost under 20,000 euros. Besides, the network of slow and fast chargers is expanding, while work is also being done on additional user information when it comes to home



Ostoja Mijailović

THE FOUNDER AND PRESIDENT OF THE OMR GROUP



charging, because it is similar to the way you charge your mobile phone in the evening.

GN *However, the impression is that people are still „afraid” of electric vehicles.*

- We have to work a lot on users' education, because people have reservations about electric vehicles primarily because of logistical issues. They are afraid that they will not have a place to charge the battery or that they will be left stranded. But we already have enough solutions for every type of user. Citizens charge their cars at home or at work, companies in their yards, and everyone at an increasing number of public charging stations on roads, in shopping centers, hotels, restaurants... With all these, people can use their vehicles without fear. Within the OMR Group, we represent top manufacturers of electric vehicles, we also have an offer from a renowned manufacturer of chargers, but we have realized that we have to offer the user, regardless of whether it is a company or an individual, something called an overall solution. That is to ensure the purchase of a vehicle through leasing, insurance and servicing, time sharing, and enabling the use of the vehicle only when you need it. The client will no longer waste energy and time to find all these by himself. Therefore, it is certain that electric vehicles will „break through” to a larger number of users, primarily through the business sector, where people will be guided by economic profitability. So when customers see the benefits, they will opt for electric vehicles to a greater extent.

GN *One of the issues that potential users complain about is the payment when charging the battery.*

- Basic battery charging is actually the charging you do „at home”, either in your home garage or company headquarters, and the payment is made through your electricity bill. After a nightly charge of five to six hours, even on a slow charger you have more than enough power, while public chargers are currently only needed for some longer trips. The money savings are significant. With charging at home, the distance of 100 kilometers costs about 200 dinars, while at a public fast charger it costs up to 700 dinars. Paying when charging at a public

charger is a challenge, but one of the companies within our Group has developed a domestic application with which it is possible to charge your electric vehicles at more than 100 stations in Serbia, pay by a payment card, and receive a domestic receipt. Therefore, in this regard, things are advancing in the direction that there will be no more obstacles.

GN *Along with the economic profitability comes the ecological one –the reduction of CO2 emissions.*

- Reducing CO2 emissions is something that all developed countries strive for. The European policy is such that soon even some forms of economic cooperation will not be possible if you do not have a certain number of vehicles in the fleet that have zero CO2 emissions. They even go so far as to ban the use of non-electric vehicles in some densely populated areas or parts of cities. In our region, we are still not close to that level, but I believe that this too will change faster than most can imagine at the moment. Something will be changed by decrees, and something by changes in people's habits. Let's face it, there will always be people who like petrol or diesel cars, who enjoy the sound of the engine and the smell of fuel, but I am also sure that there will be more and more people who will prioritize economic profitability and environmental sustainability.

GN *How important is the source from which the electricity for electric vehicles is produced?*

- This question is very important. Just as important is the global question of whether we have enough electricity and certain mineral resources for all of us to switch to electric vehicles. For Serbia, it is important where the electricity for electric vehicles comes from, because it is preferable that it is not from coal but from renewable sources. This is best illustrated by the UN data that a Tesla car when driven in India, where all electricity is obtained from coal, actually pollutes the environment with 269 grams of CO2 per kilometer, while that number in Norway, where the electricity comes from nuclear power plants, is less than 80 grams per kilometer.

Ostoja Mijailović

OSNIVAČ I PREDSEDNIK OMR GRUPE



električnih vozila, imamo i ponudu renomiranog proizvođača punjača, ali smo uvideli da moramo da ponudimo korisniku, nevažno da li je to kompanija ili pojedinac, nešto što se naziva celokupnim rešenjem. Da obezbedimo nabavku vozila putem lizinga, preko osiguranja i servisiranja, do tajm šeringa i omogućavanja korišćenja vozila samo onda kada vam je potrebno. Klijent više neće da troši energiju i vreme da to sve sam za sebe nalazi. Zbog toga je izvesno da će se električna vozila do većeg broja korisnika "probati" pre svega kroz biznis sektor u kom će se ljudi voditi ekonomskom isplativošću. Pa kada klijenti uvide prednosti, odlučivaće se za električna vozila u većoj meri.

GN Jedna od stavki na koju se potencijalni korisnici žale je i plaćanje prilikom punjenja baterije?

- Osnovno punjenje baterije je zapravo ono punjenje koje obavljate „kod kuće“, bilo u kućnoj garaži ili sedištu kompanije, a plaćanje se vrši kroz račun za struju. Posle noćnog punjenja od pet-šest sati, čak i na sporom punjaču imate i više nego dovoljno struje, dok su javni punjači trenutno potrebni tek za neka duža putovanja. Ušteda u novcu je značajna. Sa punjenjem kod kuće, pređenih 100 kilometara košta oko 200 dinara, dok na javnom brzom punjaču do 100 pređenih kilometara košta do 700 dinara. Plaćanje prilikom punjenja na javnom punjaču jeste izazov, ali jedna od kompanija u okviru naše Grupe je razvila domaću aplikaciju sa kojom je moguće dopuniti svoje elektvozila na više od 100 stanica u Srbiji, platiti putem platne kartice i dobiti domaći fiskalni račun. Dakle i u tom pogledu, stvari se odvijaju u pravcu da prepreka više gotovo i ne bude.

GN Uz ekonomsku isplativost dolazi i ona ekološka. Smanjenje emisije CO2.

- Smanjenje emisije CO2 je nešto ka čemu se teži u svim razvijenim zemljama. Evropska politika je takva da uskoro ni neki oblici privredne saradnje neće biti mogući ako u floti nemate određeni broj vozila koja su sa nultom emisijom CO2. Čak se ide toliko daleko da u nekim gusto naseljenim mestima ili delovima gradova žele da zabrane korišćenje vozila koja nisu električna. U našem regionu još uvek nismo blizu tog nivoa, ali verujem da će se i to menjati brže nego što u ovom trenutku većina može i da zamisli. Nešto će biti menjano uredbama, a nešto samim promenama navika kod ljudi. Da se razumemo, uvek će biti ljudi koji vole automobile na benzin ili dizel, koji uživaju u zvuku motora i mirisu goriva, ali sam isto tako siguran da će biti i sve više onih koji će na prvo mesto stavljati ekonomsku isplativost i ekološku odživost.

GN Koliko je bitno iz kojih izvora se proizvodi struja za električna vozila?

- Ovo pitanje je veoma važno. Kao što je važno i globalno pitanje da li imamo dovoljno struje i određenih mineralnih sirovina da svi pređemo na električna vozila. Za Srbiju je važno odakle nam dolazi struja za električna vozila, jer poželjno je da to ne bude ugalj već obnovljivi izvori. O tome najbolje govori podatak UN da jedan „Tesla“ kada se vozi u Indiji, gde se sva struja dobija iz uglja, faktični zagađuje okolinu sa 269 grama CO2 po kilometru, dok je taj broj u Norveškoj, gde struja dolazi iz nuklearki, manje od 80 grama po kilometru.

GN



Skladištenje energije za električna vozila

Energy Storage for Electric Vehicles



Kako električna vozila postaju sve prisutnija na našim putevima, pitanje reciklaže baterija postaje od suštinskog značaja

U eri rastuće zabrinutosti zbog klimatskih promena, električna vozila postaju simbol budućnosti održive mobilnosti. Njihova srž su raznovrsni sistemi za skladištenje energije, a litijum-jonske baterije prednjače kao lideri. Dok se tehnologija ubrzano razvija, baterije postaju sve efikasnije i dostupnije, obećavajući svetliju i ekološki odgovorniju budućnost za sve nas.

Kako električna vozila postaju sve prisutnija na našim putevima, pitanje reciklaže baterija postaje od suštinskog značaja. Naporima za očuvanje prirodne sredine, reciklaža baterija obećava da će sprečiti opasne materijale da uđu u otpadni tok. Kroz inovativne procese i standarde, uspešno recikliranje postaje ključno za održivu budućnost električne mobilnosti.



As electric vehicles become more and more present on our roads, the issue of battery recycling becomes essential

In an era of growing concern about climate change, electric vehicles are becoming a symbol of the future of sustainable mobility. Their essence is a variety of energy storage systems, with lithium-ion batteries leading the way. As technology rapidly evolves, batteries are becoming more efficient and available, promising a brighter and more environmentally responsible future for all of us.

As electric vehicles become more and more present on our roads, the issue of battery recycling becomes essential. In environmental efforts, battery recycling promises to prevent hazardous materials from entering the flow of waste. Through innovative processes and standards, successful recycling becomes a key to a sustainable future of electric mobility.

Litijum-jonske baterije

Litijum-jonske baterije trenutno se koriste u većini prenosivih potrošačkih uređaja, kao što su mobilni telefoni i laptopovi, zbog svoje visoke energije po jedinici mase i zapremine u odnosu na druge sisteme za skladištenje električne energije. Takođe, imaju visok odnos snaga prema težini, visoku energetska efikasnost, dobre performanse visoke temperature, dug vek trajanja i slabo samopropuštanje. Većina komponenti litijum-jonskih baterija može da se reciklira, ali troškovi oporavka materijala ostaju izazov za industriju. Veliki broj EV-eva i PHEV-ova koristi ovu vrstu baterija, čija su istraživanja i razvoj u toku kako bi se smanjili njihovi relativno visoki troškovi, produžio im se koristan život, koristilo manje kobalta i kako bi se uklonile bezbednosne nedoumice u pogledu različitih uslova kvara.

Lithium-ion batteries

Lithium-ion batteries are currently used in most portable consumer devices, such as mobile phones and laptops, due to their high energy per unit mass and volume compared to other electrical energy storage systems. Also, they have a high power-to-weight ratio, high energy efficiency, good high temperature performance, long lifecycle and low self-leakage. Most components of lithium-ion batteries can be recycled, but the cost of recovering the materials remains a challenge for the industry. A large number of EVs and PHEVs use this type of battery, and research and development is underway in order to reduce their relatively high cost, extend their useful life, use less cobalt, and eliminate safety concerns regarding various failure conditions.

Nikl-metal hibridne baterije

Nikl-metal hibridne baterije, koje se rutinski koriste u računarskoj i medicinskoj opremi, nude razumnu specifičnu energiju i specifične mogućnosti napajanja. Imaju mnogo duži ciklus od baterija olovne kiseline i bezbedne su. Uglavnom se koriste u HEV-ima. Glavni izazovi za ovu vrstu baterija jesu njihova visoka cena, visoka stopa samopražnjenja, proizvodnja toplote na visokim temperaturama i potreba za kontrolom gubitka vodonika.

Baterije s olovnom kiselinom



Ove baterije mogu biti dizajnirane da budu visoke snage, jeftine, reciklirane i pouzdane. Međutim, niska specifična energija, slabe performanse hladne temperature i kratak životni vek ometaju njihovu upotrebu. U toku je razvoj naprednih baterija olovne kiseline velike snage, ali koriste se samo u komercijalno dostupnim vozilima na električni pogon za pomoćna opterećenja. Takođe, koriste se za start-stop funkciju u vozilima motora sa unutrašnjim sagorevanjem, kako bi se eliminisalo stajanje tokom zaustavljanja i smanjila potrošnja goriva.

Ultracapilatori

Ultracapilatori skladište energiju u interfejsu između elektrode i elektrolita kada se napon primenjuje. Kapacitet skladištenja energije se povećava srazmerno povećanju njihove površine. Iako ultracapilatori imaju nisku energetska gustinu, imaju veoma visoku gustinu energije, što znači da za kratko vreme mogu da isporuče visoke količine energije. Obezbeđuju vozilima dodatnu snagu tokom ubrzanja i penjanja uzbrdo i doprinose oporavku energije kočenja. Takođe, mogu da budu korisni kao sekundarni uređaji za skladištenje energije u vozilima sa električnim pogonom jer pomažu elektrohemijским baterijama da izjednače napajanje.



Nickel-metal hybrid batteries

Nickel-metal hybrid batteries, routinely used in computer and medical equipment, offer reasonable specific energy and specific power capabilities. They have a much longer cycle than lead acid batteries and, they are safe. They are mainly used in HEVs. The main challenges for this type of batteries are their high cost, high self-discharge rate, heat production at high temperatures, and the need to control hydrogen loss.

These batteries can be designed to be high power, cheap, recyclable and reliable. However, low specific energy, poor cold temperature performance, and short lifetime hinder their use. Advanced high-power lead-acid batteries are under development, but they are only used in commercially available electric vehicles for auxiliary loads. Also, they are used for the stop-start function in vehicles with internal combustion engines, in order to eliminate stalling during stopping and reduce fuel consumption.

Lead acid batteries



Ultracapacitors

Ultracapacitors store energy at the interface between the electrode and the electrolyte when a voltage is applied. The energy storage capacity increases in proportion to the increase in their surface area. Although ultracapacitors have low energy density, they have very high power density, which means they can deliver a great amount of energy in a short time. They provide vehicles with additional power during acceleration and hill climbing, and contribute to the recovery of the energy of braking. They can also be useful as a secondary energy storage device in electric vehicles by helping the electrochemical batteries to equalize the power supply.





Rasprostranjena reciklaža baterija pomogla bi da opasne materije ne uđu u otpadni tok, kako na kraju korisnog trajanja baterije, tako ni tokom njene proizvodnje. U toku su radovi na razvoju procesa reciklaže baterija koji minimiziraju uticaje životnog ciklusa korišćenja litijum-jonskih i drugih vrsta baterija u vozilima. Međutim, nisu svi procesi reciklaže isti i potrebne su različite metode razdvajanja za oporavak materijala.

TOPIONICA

Procesi topljenja oporavljaju osnovne elemente ili soli. Ovi procesi sada su u velikom obimu i mogu da prihvate više vrsta baterija, uključujući litijum-jonske i niki-metal. Topljenje se odvija na visokim temperaturama gde organski materijali (elektrolit i ugljenične anode) sagorevaju kao gorivo ili reduktant. Vredni metali se oporavljaju i šalju na preradu tako da proizvod bude pogodan za svaku upotrebu. Ostali materijali (litijum) nalaze se u šljaci, koja se koristi kao dodatak betonu.

DIREKTAN OPORAVAK

U drugoj krajnosti, neki procesi reciklaže direktno oporavljaju materijale za ocenu baterije. Komponente su razdvojene raznim fizičkim ili hemijskim procesima, a svi aktivni materijali i metali mogu da se povrate. Direktna oporavak je proces niske temperature sa minimalnim energetske zahtevom.

POSREDNIČKI PROCESI

Treća vrsta procesa je između dve krajnosti. Oni prihvataju više vrsta baterija, za razliku od direktnog ili oporavak, ali oporavljaju materijale dalje duž lanca proizvodnje, nego što to čini topljenje.

Razdvajanje različitih vrsta akumulatorskih materijala često je kamen spoticanja u oporavku materijala visoke vrednosti. Zbog toga je dizajn baterije koji smatra razdvajanje i reciklažu važnim jako bitan kako bi vozila na električni pogon uspešna sa stanovišta održivosti. Standardizacija baterija, materijala i dizajna ćelija takođe bi olakšala recikliranje, kao i njenu isplativost.

Velika šansa za reciklažu

BATERIJE „VOZE” PROMENE

Uz svaki okret točka električnog vozila, svet se polako ali sigurno kreće prema održivijoj budućnosti. Srce ovog preobražaja leži u naprednim baterijskim tehnologijama koje omogućavaju električnim vozilima da postignu ekološki prihvatljivu mobilnost. Sistemi za skladištenje energije, obično baterije, od suštinskog su značaja za sva električna vozila (EV), plug-in hibridna električna vozila (PHEV) i hibridna električna vozila (HEV).



BATTERIES „DRIVE” CHANGES

With every turn of the wheel of an electric vehicle, the world is slowly but surely moving towards a more sustainable future. The heart of this transformation lies in advanced battery technologies that enable electric vehicles to achieve environmentally acceptable mobility.

Energy storage systems, usually batteries, are essential for all electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs) and hybrid electric vehicles (HEVs).

A Great Chance for Recycling

Widespread battery recycling would help prevent hazardous substances from entering the flow of waste, both at the end of the battery's lifespan and during its production. The work on the development of battery recycling processes that minimize the life cycle impacts of using lithium-ion and other types of batteries in vehicles is underway. However, not all recycling processes are the same, and different separation methods are required to recover the material.

SMELTER

Smelting processes recover basic elements or salts. These processes are now extensive, and they can accept multiple types of batteries, including lithium-ion and nickel-metal. The smelting takes place at high temperatures where organic materials (electrolyte and carbon anodes) burn as fuel or reductant. Valuable metals are recovered and sent for the processing so that the product is suitable for any use. Other materials (lithium) are found in slag, which is used as an additive to concrete.

DIRECT RECOVERY

At the other extreme, some recycling processes directly recover materials for battery grading. Components are separated. By various physical or chemical processes, all active materials and metals can be recovered. Direct recovery is a low temperature process with minimal energy requirements.

INTERMEDIATE PROCESSES

The third type of process is between the two extremes. It accepts more battery types, unlike direct or recovery one, but recovers materials more in the production chain than the smelting does.

Separation of different types of battery materials is often a stumbling block in the recovery of high-value materials. Therefore, battery design that considers the separation and recycling is essential for electric vehicles to succeed, from a sustainability standpoint.

The standardization of batteries, materials and cells design would also make recycling easier and more cost-effective.



STARE BATERIJE spašavaju kritične minerale

Produženjem veka trajanja baterije, smanjuje se potreba za daljom eksploatacijom prirodnih resursa, a smanjuje se i potražnja za sirovinama i, generalno, podstiče se održiviji proces. Skoro svi kritični materijali unutar baterija, uključujući litijum, nikel i kobalt, mogu se ponovo koristiti



OLD BATTERIES Save Critical Minerals

By extending the life of the battery, the need for further exploitation of natural resources is reduced as well as the demand for raw materials, and, in general, a more sustainable process is encouraged. Almost all of the critical materials inside batteries, including lithium, nickel and cobalt, can be reused



Na parceli od osam hektara, smeštenoj izvan malog grada Nju Kujama u Južnoj Kaliforniji, solarna farma od 1,5 megavata koristi sunčeve zrake da polako puni skoro 600 baterija. Noću, kada potražnja za energijom raste, ta električna energija se šalje u mrežu za napajanje domova čistom energijom.

Da bi obnovljiva energija iz povremenih izvora poput sunca i vetra bila dostupna kada je najpotrebnija, sve je ustaljenije koristiti baterije za skladištenje energije, u skladu s tim kako se generiše i kasnije prenosi. Ali, jedna stvar u vezi sa postrojenjem Kujama, koje je počelo sa radom ovog meseca, manje je uobičajen: baterije koje šalju energiju u mrežu nekada su pokretale električna vozila.

Objekat SEPV Kujana, koji se nalazi oko dva sata severoistočno od Santa Barbare, drugi je hibridni

skladišni objekat koji je otvorila kompanija „B2U Storage Solutions“. Njeno prvo postrojenje, nedaleko od Los Anđelesa, koristi 1.300 „penzionisanih“ baterija iz Honde i Nisana za skladištenje 28 megavat-sati energije, što je dovoljno za napajanje oko 9.500 domova.

UPOTREBA „PENZIONISANIH“ BATERIJA

Ako se pitate koji je cilj ovih objekata, to je da dokažu da „penzionisane“ baterije iz EV vozila mogu dobiti drugu šansu, pre nego što se recikliraju. Zapravo, sama ideja bi mogla povećati održivost lanca snabdevanja tehnologije i smanjiti potrebu za iskopavanjem kritičnih minerala, istovremeno

On an eight-acre plot of land, located outside the small Southern California town of New Cuyama, the 1.5-megawatt solar farm uses the sun's rays to slowly charge nearly 600 batteries. At night, when energy demand rises, that electricity is sent to the grid to power homes with clean energy.

To make renewable energy from intermittent sources like the sun and wind available when it is needed most, it is increasingly common to use batteries to store energy, according to how it is generated and later transmitted. But one thing about the Cuyama plant, which has started operating this month, is less common: the batteries that transmit power to the grid once powered electric vehicles.

The SEPV Cuyama facility, located about two hours northeast of Santa Barbara, is the second hybrid

storage facility opened by B2U Storage Solutions. Its first facility, just outside Los Angeles, uses 1,300 „retired“ batteries from Honda and Nissan to store 28 megawatt-hours of energy, enough to power about 9,500 homes.

THE USE OF „RETIRED“ BATTERIES

If you are wondering what the goal of these facilities is, it is to prove that „retired“ batteries from EVs can get a second chance, before being recycled. In fact, the idea itself could increase the sustainability of the technology's supply chain and reduce the need to mine critical minerals, while providing a cheaper way to build online storage. Namely, almost all of the





pružajući jeftiniji način izgradnje skladišta na mreži. Naime, skoro svi kritični materijali unutar baterija, uključujući litijum, nikel i kobalt, mogu se ponovo koristiti.

Rastuća američka industrija reciklaže, podržana milijardama dolara zajmova Ministarstva energetike i podsticajima shodno Zakonu o smanjenju inflacije, treba već sada da se pripremi za ono što dolazi, a to je: desetina miliona „penzionisanih“ baterija za EV.

„Videli smo kako prva generacija električnih vozila završava svoje, a 70 ili više procenata tih baterija ima veoma jaku preostalu vrednost“, rekao je Hol i dodao: „To bi trebalo

da se iskoristi pre nego što se sve te baterije recikliraju, a mi samo odlažemo reciklažu za tri, četiri ili pet godina“.

UŠTEDA PRIRODNIH RESURSA

Osim toga, produženje životnog veka EV baterija ublažava uticaj njihove proizvodnje, dakle, cela poenta ovog pokušaja je u smanjenju emisija i negativnih uticaja stvari kao što su procesi proizvodnje i ekstrakcije. Produženjem veka trajanja baterije, smanjuje se potreba za daljom eksploatacijom prirodnih resursa,

a smanjuje se i potražnja za sirovinama i, generalno, podstiče se održiviji proces.

Baš kao što su baterije postale ključne za smanjenje emisija iz transporta, potrebne su i da bi se u potpunosti shvatile prednosti čiste energije. Bez stacionarnog skladišta, energija vetra i solarna energija mogu da napajaju mrežu samo kada vetar duva ili sunce sija. Ovi paketi se, inače, čuvaju u velikim ormarićima i njima se upravlja pomoću vlasničkog softvera, koji prati njihovu bezbednost i prazni i puni svaku bateriju na osnovu njenog kapaciteta. Baterije se pune tokom dana i iz solarnih panela i iz mreže.



critical materials inside batteries, including lithium, nickel and cobalt, can be reused.

Growing America's recycling industry, supported by billions of dollars in Department of Energy loans and stimulus under the Inflation Reduction Act, needs to prepare itself now for what is coming: tens of millions of „retired“ EV batteries.

„We have seen the first generation of electric vehicles come to the end of their life, and 70 percent or more of those batteries have very strong residual value,“ Hall said, adding, „That should be used up before all those batteries

are recycled, and we just postpone recycling for three, four or five years“.

SAVING NATURAL RESOURCES

Additionally, extending the lifespan of EV batteries mitigates the impact of their production, so the whole point of this effort is to reduce emissions and negative impacts from manufacturing and extraction processes. By extending the life of the battery, the need for further exploitation of natural resources is reduced as well as the demand for raw materials, and, in

general, a more sustainable process is encouraged.

Just as batteries have become critical for the reduction of transportation emissions, they are also needed to fully realize the benefits of clean energy. Without stationary storage, wind and solar energy can only power the grid when the wind blows or the sun shines. These packs, by the way, are stored in large cabinets and managed by proprietary software, which monitors their security, and discharges and charges each battery based on its capacity. The batteries are charged during the day from both solar panels and the grid.




Vladan Komatović

GENERALNI DIREKTOR KOMPANIJE GREEN ENERGY 360

Ključ naše strategije je u kvalitetnom održavanju sistema

Naša kompanija se od prvog dana vodi isključivo kvalitetom, znanjem i brzinom regovanja. Trudimo se da u svakom trenutku imamo na lageru preko 10MW opreme, što investitorima kasnije uliva sigurnost i u održavanju

Ako pogledate koliko energije troši današnje potrošačko društvo sa jedne strane, i sa druge strane primarne izvore energije koji su i dalje nafta, gas, uglj i delimično hidro i nuklearna energija, jasno je da zagađenje životne sredine eksponencijalno raste, objasnio je u intervjuu za naš magazin generalni direktor kompanije Green Energy 360, Vladan Komatović.

GN Industrija solarnih panela neprestano napreduje. Koji su to ključni trendovi ili inovacije trenutno najznačajniji u poslovanju Vaše kompanije?

- Mislim da ljudi realno nisu svesni šta se dogodilo sa našom planetom za samo 200 godina od pojave industrijske revolucije. Do tada je čovek živeo u skladu sa prirodom, živa bića su koristila energiju koja im je realno bila potrebna. Pronalaskom parnih mašina, nafte i motora sa unutrašnjim sagorevanjem život čoveka je postao mnogo lakši i produktivniji, ali je to povuklo za sobom i potrebu za energijom. Ako pogledate koliko energije troši današnje potrošačko društvo sa jedne strane, i sa druge strane primarne izvore energije koji su i dalje nafta, gas, uglj i delimično hidro i nuklearna energija, jasno je da zagađenje životne sredine eksponencijalno raste. Zakonske i finansijske regulative u svetu nameću hitnu i brzu tranziciju ka obnovljivim izvorima

energije, a Green Energy 360 je zahvaljujući znanju u energetici i brzini reagovanja za kratak period postao lider u regiji.

GN Kako vaša kompanija pristupa odabiru proizvođača solarnih panela i koje tehnologije preferirate kako biste osigurali visoki kvalitet proizvoda i usluga?

- Kompanija se od prvog dana vodi isključivo kvalitetom, znanjem i brzinom regovanja. Radimo sa par najvećih i najpoznatijih proizvođača opreme. Na tržištu se često pojave i jeftiniji proizvodi, ali ako ste kao naša kompanija, koja samo ove godine gradi preko 40MW elektrana, morate uvek da imate velike lagere i sigurne dobavljače. Trudimo se da u svakom trenutku imamo na lageru preko 10MW opreme, što investitorima kasnije uliva sigurnost i u održavanju.

GN Maksimalna efikasnost i dugoročna održivost su sinonim za solarne panele. Koji su najvažniji faktori koje uzimate u obzir prilikom planiranja i izvođenja njihovih instalacija?

- Prilikom projektovanja ključno je inženjersko znanje u odabiru veličine elektrane, načinu rada i mogućnošću da se što više energije pametno iskoristi. Ovde nije reč samo o elektrani već i o postojećem energetsom sistemu koji treba i dalje da radi paralelno sa elektranom. Jako je bitna i provera

GN ►►



Vladan Komatović

GENERAL MANAGER OF THE GREEN ENERGY 360 COMPANY

The Key to Our Strategy is Quality System Maintenance

From its first day, our company has been run exclusively by quality, knowledge and the speed of response. We try to have more than 10 MW of equipment in stock at all times, which provides security for investors in maintenance later on



If you look at how much energy today's consumer society consumes, on the one hand, and primary sources of energy, which are still oil, gas, coal, and partly hydro and nuclear energy, on the other hand, it is clear that environmental pollution is growing exponentially, explained Vladan Komatović, the General Manager of the Green Energy 360 company in an interview for our magazine.

GN *The solar panel industry is constantly advancing. What are currently the most important key trends or innovations in your company's business operations?*

- I think that people are not really aware of what has happened to our planet in just 200 years since the advent of the industrial revolution. Until then, man lived in harmony with nature, living beings used the energy they really needed. The invention of the steam engine, oil, and the internal combustion engine, made human life much easier and more productive, but it also brought with it the need for energy. If you look at how much energy today's consumer society consumes on the one hand, and primary sources of energy, which are still oil, gas, coal and partly hydro and nuclear energy, on the other hand, it is clear that environmental pollution is growing exponentially. Legal and financial regulations in the world impose an urgent and rapid transition to renewable energy sources, and Green Energy 360 has become a leader in the region in a short period of time thanks to its knowledge in the energy sector and the speed of response.

GN *How does your company approach the selection of solar panel manufacturers, and what technologies do you prefer in order to ensure high quality products and services?*

- From its first day, the company has been run exclusively by quality, knowledge and the speed of response. We work with some of the largest and most famous equipment manufacturers. Cheaper products often appear on the market, but if you are like our company, which is building over 40 MW of power plants this year alone, you must always have large stocks and reliable suppliers. We try to have more than 10MW of equipment in stock at all times, which provides security for investors in maintenance.

GN *Maximum efficiency and long-term sustainability are synonymous with solar panels. What are the most important factors you consider when planning and performing their installations?*

- When designing, engineering knowledge is the key in choosing the size of the power plant, the way it works and the ability to use smartly as much energy as possible. This is not only about the power plant, but also about the existing energy system, which should continue to work together with the power plant. It is also very important to check the statics of the roof on which the power plant is installed; often these loads amount to several tons.

GN *How does your company face renewable energy challenges, such as fluctuations in energy production or dependence on weather conditions?*

- Solar and wind are very unstable energy sources, and they are difficult to balance in energy systems. We have licensed our GWH company for electricity trading. This allows us to offer our clients the placement of their energy on the market, as well



Vladan Komatović

GENERALNI DIREKTOR KOMPANIJE GREEN ENERGY 360

Prilikom projektovanja ključno je inženjersko znanje u odabiru veličine elektrane, načinu rada i mogućnošću da se što više energije pametno iskoristi



statike krova na koji se postavlja elektrana; često ta opterećenja iznose i po nekoliko tona.

GN *Kako se vaša kompanija suočava sa izazovima u vezi obnovljivih izvora energije, poput fluktuacija u proizvodnji energije ili zavisnosti od vremenskih uslova?*

- Solar i vetar su jako nestabilni izvori energije i teški su za balansiranje u energetskim sistemima. Mi smo našu kompaniju GWH licencirali za trgovinu strujom. To nam omogućava da našim klijentima ponudimo i plasiranje njihove energije na tržištu, kao i balansiranje putem interdnevne trgovine koja je od skoro aktivna i na nasoj Seepex berzi.

GN *Možete li nam predstaviti primere uspešnih projekata u kojima je vaša kompanija učestvovala?*

- Ima mnogo projekata i sigurno ću nekog zaboraviti, ali definitivno najveći investitori sa kojima smo radili su CTP, Metalfer, MK Group, BIG tržni centri, Gemax, NIS, Intertron, Abbot i drugi.

GN *Koje strategije Green Energy 360 primenjuje kako bi osigurala dugoročnu održivost instaliranih solarnih*

rešenja, uključujući praćenje performansi i njihovo održavanje?

- Kao i u svemu, ključ je održavanje sistema. Nekada prestane sa radom samo jedan panel, ali izbací iz sistema i ceo string. Dešava se da se paneli zaprljaju pa da proizvodnja padne i 50 odsto. Zahvaljujući velikom broju izgrađenih elektrana, Green Energy 360 ima tim koji se bavi samo održavanjem i pranjem elektrana. Takođe, lager od preko 10MW nam omogućava da odmah zamenimo opremu koja je ispala iz rada. Trenutno ulažemo i u neka programska rešenja koja će nam omogućiti još bolji monitoring iz kontrolnog centra.

GN *Da li optimistično gledate na perspektivu razvoja solarnih tehnologija u budućnosti i kakve prilike, ali i izazove, očekujete za vašu kompaniju u tom kontekstu?*

- Definitivno smo kao zemlja na početku energetske tranzicije ka obnovljivim izvorima energije. Ovde mislim i na neke druge sisteme kao što su hidrogen, vetar, baterijsko skladištenje energije itd. Ključ je u usavršavanju, a to nam omogućava da pratimo nove trendove. Srećni smo što uspevamo barem delom da pomognemo u očuvanju životne sredine.

GN



Foto: Green Energy 360

Vladan Komatović

GENERAL MANAGER OF THE GREEN ENERGY 360 COMPANY



Foto: Green Energy 360

When designing, engineering knowledge is the key in choosing the size of the power plant, the way it works, and the ability to use smartly as much energy as possible



as balancing through intraday trading, which has been active on our Seepex stock exchange since recently.

GN *Can you present us with examples of successful projects in which your company has participated?*

- There are many projects and I am sure I will forget some, but definitely the biggest investors we have worked with are CTP, Metalfer, MK Group, BIG shopping centers, Gemax, BSS, NIS, Intertron, Abbot, and others.

GN *What strategies does Green Energy 360 employ to ensure the long-term sustainability of installed solar solutions, including the monitoring of their performance and maintenance?*

- As with everything, the key is the maintenance of the system. Sometimes only one panel stops working, but it throws the entire string out of the system. It happens that panels get dirty and the production

drops by 50 percent. Thanks to the large number of power plants built, Green Energy 360 has a team that only deals with the maintenance and cleaning of power plants. Also, the stock of over 10MW allows us to immediately replace equipment that has fallen out of operation. We are currently investing in some software solutions that will enable even better monitoring from the control center.

GN *Are you optimistic about the future development of solar technologies, and what opportunities and challenges do you expect for your company in this context?*

- As a country, we are definitely at the beginning of the energy transition towards renewable energy sources. Here I mean some other systems such as hydrogen, wind, battery energy storage, etc. The key is in improvement, and this allows us to follow new trends. We are happy that we succeed at least partly in helping to protect the environment.

GN

Obnovljivi dizel uzima primat u ekološkom transportu

Renewable Diesel Takes the Lead in Ecological Transport

Ovo čarobno gorivo proizvodi se od masti i ulja, poput sojinog ili kanolinog ulja, i prolazi kroz procese koji ga čine hemijski sličnim benzinskom dizelu

GRE EN
FOS SIL
F U E L

This magic fuel is made from fats and oils, such as soybean or canola oil, and goes through processes that make it chemically similar to diesel



U eri brige o ekologiji i održivosti, obnovljivi dizel postaje sveprisutno gorivo koje obećava revoluciju u industriji transporta. Ovo čarobno gorivo proizvodi se od masti i ulja, poput sojinog ili kanolinog ulja, i prolazi kroz procese koji ga čine hemijski sličnim benzinskom dizelu. Ono ispunjava stroge specifikacije kao što su ASTM D975 u SAD i EN590 u Evropi, otvarajući vrata novoj ekološki prihvatljivoj budućnosti transporta.

Dok mnogi možda poistovećuju obnovljivi dizel sa bio dizelom, važno je napomenuti da su ova dva goriva potpuno različita. Obnovljivi dizelaš, ranije poznat kao zeleni dizel, proizvodi se uglavnom hidrotretacijom i drugim tehnologijama. Bio dizel, sa druge strane, nastaje putem transesterifikacije i odgovara specifikacijama ASTM D6751. Oba goriva imaju svoje prednosti, ali obnovljivi dizel je na vrhu liste kada je u pitanju zadovoljavanje visokih ekoloških standarda.

Proces proizvodnje obnovljivog dizela je raznolik, a tehnološki putevi uključuju tradicionalnu hidrotretaciju, biološku nadogradnju šećera, katalitičku konverziju šećera, gasifikaciju, pirolizu i hidrotermalnu obradu. Svaka od ovih metoda ima svoje prednosti i omogućava upotrebu različitih vrsta feedstock-a, pružajući fleksibilnost i održivost u proizvodnji.

Obnovljivi dizel donosi brojne prednosti, uključujući kompatibilnost sa postojećim dizel motorima i infrastrukturom, smanjenje emisija štetnih gasova i veću fleksibilnost u upotrebi. Studija NREL-a pokazala je da obnovljivi dizel smanjuje emisiju ugljen-dioksida i azotnih oksida u poređenju sa benzinskim dizelom, a standard niskog ugljeničnog goriva potvrđuje njegovu ekološku prednost.

Svet se okreće prema obnovljivom dizelu, a budućnost izgleda svetla i ekološki odgovorna.

TRANSESTERIFIKACIJA

je hemijski proces koji se koristi za proizvodnju biodizela, a koji podrazumeva zamenu esterskih grupa (glicerinskih estera) u molekulima triglicerida (koji se obično nalaze u biljnim uljima i životinjskim mastima) sa metilnim, etilnim ili drugim alkalnim esterima.

HIDROTRETACIJA

takođe poznata kao hidrogenizacija, je hemijski proces u kojem se molekuli nezasićenih ugljovodonika (kao što su ulja, masti i druge organske supstance) tretiraju vodonikom u prisustvu odgovarajućeg katalizatora, obično metalnog, pri visokim temperaturama i pritiscima. Ovaj proces ima za cilj smanjenje sadržaja nezasićenih veza u molekulima ugljovodonika, pretvarajući ih u zasićene veze, što rezultira stvaranjem više stabilnih i manje reaktivnih molekula.

Hidrotretacija se često koristi u različitim industrijskim procesima, uključujući preradu nafte, proizvodnju obnovljivog dizela i drugih goriva, kao i u prehrambenoj industriji za hidrogenizaciju biljnih ulja radi produkcije čvrstih masti kao što su margarin i trans-masti.

BIOLOŠKA NADOGRAĐNJA ŠEĆERA

je proces u kojem se šećeri, obično iz biljnih izvora, transformišu u različite hemijske jedinice, uključujući ugljovodonike koji se mogu koristiti kao goriva ili hemikalije u raznim industrijskim procesima. Ovaj proces oslanja se na mikroorganizme, kao što su bakterije ili kvasci, koji koriste šećere kao izvor energije i resursa za rast, i tako ih pretvaraju u druge produkte. Ovaj proces je važan jer omogućava konverziju obnovljivih izvora šećera, kao što su šećerni trska, kukuruz i druge biljke, u korisne i održive proizvode, doprinoseći smanjenju zavisnosti od fosilnih goriva i smanjenju emisija štetnih gasova.

In an era of concern for ecology and sustainability, renewable diesel is becoming omnipresent fuel that promises to revolutionize the transportation industry. This magic fuel is made from fats and oils, such as soybean or canola oil, and goes through processes that make it chemically similar to diesel. It meets stringent specifications such as ASTM D975 in the US, and EN590 in Europe, opening the door to a new environmentally friendly future of transportation.

While many may equate renewable diesel with biodiesel, it is important to note that the two fuels are completely different. Renewable diesel, formerly known as green diesel, is produced mainly by hydrotreating and other technologies. Biodiesel, on the other hand, is produced via transesterification and meets the ASTM D6751 specifications. Both fuels have their advantages, but renewable diesel is at the top of the list when it comes to meeting high environmental standards.

The production process of renewable diesel is diverse, and technological pathways include traditional hydrotreating, biological upgrading of sugars, catalytic sugar conversion, gasification, pyrolysis, and hydrothermal treatment. Each of these methods has its advantages and allows the use of different types of feedstock, providing flexibility and sustainability in production.

Renewable diesel brings numerous benefits, including compatibility with existing diesel engines and infrastructure, reduced emissions and greater flexibility in use. An NREL study found that renewable diesel reduces carbon dioxide and nitrogen oxide emissions compared to diesel, and the standard of low-carbon fuel confirms its environmental benefits.

The world is turning towards renewable diesel, and the future looks bright and environmentally responsible.

TRANSESTERIFICATION

is a chemical process used to produce biodiesel, which involves replacing ester groups (glycerol esters) in triglyceride molecules (commonly found in vegetable oils and animal fats) with methyl, ethyl or other alkaline esters.

HYDROTREATING

also known as hydrogenation, is a chemical process in which molecules of unsaturated hydrocarbons (such as oils, fats, and other organic substances) are treated with hydrogen in the presence of a suitable catalyst, usually metallic, at high temperatures and pressures. This process aims to reduce the content of unsaturated bonds in hydrocarbon molecules, turning them into saturated bonds, resulting in the creation of more stable and less reactive molecules. Hydrotreating is often used in a variety of industrial processes, including oil refining, the production of renewable diesel and other fuels, and in the food industry to hydrogenate vegetable oils to produce solid fats such as margarine and trans fats.

BIOLOGICAL UPGRADING OF SUGARS

is a process in which sugars, usually from plant sources, are transformed into various chemical units, including hydrocarbons that can be used as fuels or chemicals in various industrial processes. This process relies on microorganisms, such as bacteria or yeasts, which use sugars as a source of energy and resources for growth, and thus convert them into other products. This process is important because it allows the conversion of renewable sources of sugar, such as sugar cane, corn and other plants, into useful and sustainable products, contributing to the reduction of dependence on fossil fuels and the reduction of harmful gas emissions.



KATALITIČKA KONVERZIJA ŠEĆERA

je hemijski proces koji se koristi za pretvaranje šećera u različite proizvode, uključujući goriva, hemikalije i druge supstance, uz pomoć katalizatora. Ovaj proces ima veliki potencijal za smanjenje emisija štetnih gasova i doprinosi održivim pristupima proizvodnji goriva i hemikalija.

GLAVNA PREDNOST GASIFIKACIJE

je da omogućava konverziju različitih vrsta sirovina u koristan i energetski bogat gas koji može biti korišćen za razne svrhe, uključujući proizvodnju električne energije, toplote, ili čak kao zamena za prirodni gas. Ovaj proces takođe može biti deo održivih pristupa smanjenju emisija štetnih gasova i upotrebi obnovljivih izvora energije.

PIROLIZA

je hemijski proces u kojem organske materije, kao što su biomasa, plastika, guma, ili ostaci hrane, podvrgavaju termičkom raspadanju na visokim temperaturama u odsustvu kiseonika. Ovaj proces razlaže složene organske materije u jednostavnije molekule, uključujući gasove, tečnosti i čvrste ostatke. Proliza je važan proces u kontekstu održive proizvodnje i recikliranja jer omogućava pretvaranje različitih organskih materijala u korisne proizvode, čime se smanjuje otpad i smanjuju emisije štetnih gasova povezanih sa spaljivanjem ovih materijala.

HIDROTERMALNA OBRADA

je hemijski proces koji podrazumeva tretiranje materijala vodom pod visokim pritiskom i temperaturom. Ovaj proces se često koristi u različite svrhe, uključujući preradu biomase, recikliranje otpada, proizvodnju goriva i hemikalija, kao i druge primene.



CATALYTIC CONVERSION OF SUGAR

is a chemical process used to convert sugar into various products, including fuels, chemicals and other substances, with the help of catalysts. This process has great potential to reduce emissions and contribute to sustainable approaches to the production of fuels and chemicals.

THE MAIN ADVANTAGE OF GASIFICATION

is that it enables the conversion of different types of raw materials into a useful and energy-rich gas that can be used for various purposes, including the production of electricity, heat, or even as a substitute for natural gas. This process can also be part of sustainable approaches to reducing harmful gas emissions and using renewable energy sources.

PYROLYSIS

is a chemical process in which organic matter, such as biomass, plastic, rubber, or food waste, undergoes thermal decomposition at high temperatures in the absence of oxygen. This process breaks down complex organic matter into simpler molecules, including gases, liquids and solid residues. Pyrolysis is an important process in the context of sustainable production and recycling as it enables the conversion of various organic materials into useful products, thus reducing waste and emissions of harmful gases associated with incineration of these materials.

HYDROTHERMAL TREATMENT

is a chemical process that involves treating materials with water under high pressure and temperature. This process is often used for a variety of purposes, including biomass processing, waste recycling, fuel and chemical production, and other applications.



Čista energija za zelenu budućnost

Kompanija GREEN ENERGY 360 posvećena je održivom razvoju, očuvanju prirodnih resursa i energetske transformaciji kroz primenu solarne energije.

Uz distribuciju vrhunske solarne tehnologije, nudimo vam i najsavremenija rešenja u projektovanju i montaži solarnih elektrana, kao i usluge planiranja, organizacije, izgradnje i održavanja.

greenenergy360.com



Rastu apetiti

Očekuje se da će kiša, koja je ispod proseka, a koja obično traje između juna i kraja septembra u ovoj mnogoljudnoj zemlji, rezultirati manjom proizvodnjom hidroelektrične energije u narednim mesecima. Uvoz LNG-a u Indiji opada tri uzastopne godine zaredom



Appetites Are Growing

It is expected that below-average rainfall, which typically lasts between June and late September in this populous country, will result in lower hydroelectricity production in the coming months. India's LNG imports have fallen for three consecutive financial years





U jeku prolongirane energetske krize, Indija traži dodatne količine prirodnog gasa, te je zahtevala od komunalnih preduzeća da ubrzaju završetak održavanja elektrane, kao deo hitnih koraka za zaustavljanje nestanka struje, navodi se u vladinoj belešci.

Ovaj potez je, ističe se, usledio nakon proširenja zakona o vanrednim situacijama koji primorava elektrane koje rade na uvezeni ugallj - da maksimiziraju proizvodnju.

Ovo je posledica rekordne potražnje za električnom energijom u avgustu, zbog neobično suvog vremena, a nagli pad proizvodnje hidro i energije vetra doveo je do toga da se Indija suočila sa najvećim nedostatkom struje u poslednjih 16 meseci.

HITNA POTREBA ZA OBNOVLJIVIM RESURSIMA

„Države Indije moraju osigurati da sve elektrane na gas, sa kojima imaju ugovore o kupovini električne energije budu stavljene u upotrebu, u danima velike potražnje“, piše u belešci Ministarstva energetike Indije.

Dodaje se da treba uložiti sve napore da se jedinice iz prinudnog isključenja što pre vrata u pogon. To znači i da bi indijske države, odnosno teritorije trebalo da pokušaju da ubrzaju puštanje u rad novih obnovljivih resursa i termoelektrana. Navodi se da bi ovaj potez mogao da poveća potražnju za prirodnim gasom i da podstakne Indiju da traži više LNG-a (tečnog prirodnog gasa) na spot tržištu.

VRUĆINE POVEĆALE POTROŠNJU

Inače, uvoz indijskog LNG-a je opao tri uzastopne fiskalne godine zaredom, koje su se završile u martu 2023, pokazuju vladini podaci. Prema podacima resornog ministarstva, planiran je dodatni aranžman za gas, za rad stanica na bazi gasa, tokom predstojećih meseci velike potražnje za električnom energijom. Indijska potražnja za električnom energijom brzo je rasla nakon pandemije, sa snažnim ekonomskim rastom koji je podstakao potražnju iz fabrika, a letnje vrućine su povećavale potrošnju domaćinstava.

Ugallj je činio više od 73 odsto proizvodnje električne energije u Indiji do marta 2023, dok obnovljivi izvori energije, uključujući vetar i



Obnovljivi izvori energije, uključujući vetar i solarnu energiju, čine više od 11 odsto ukupne proizvodnje

Renewable energy sources, including wind and solar energy, account for more than 11 percent of total production



In the midst of a prolonged energy crisis, India is seeking additional natural gas supplies, and has asked utility companies to expedite completion of power plants' maintenance as part of urgent steps to stop electricity outages, according to a government's note.

It is pointed out that this move followed extension of an emergency law, which forces power plants operating on imported coal to maximize production.

This is the consequence of record demands for electricity in August, due to unusually dry weather. A sharp decline in hydro and wind power production has left India facing its worst power shortage in the last 16 months.

AN URGENT NEED FOR RENEWABLE RESOURCES

„States of India must ensure that all gas based power plants with whom they have power purchase agreements are brought into use during high demand days,“ India's Ministry of Energy informed.

It is added that all efforts should be made to bring back the units under forced outage as soon as possible. This also means that Indian states and territories should try to speed up the commissioning of new renewable resources and thermal power plants. It is said that this move could increase demand for natural gas and encourage India to seek more LNG (liquefied natural gas) in the spot market.

THE HEAT INCREASED CONSUMPTION

Otherwise, India's LNG imports have fallen for three consecutive financial years ended March 2023, as government's data showed. According to the Ministry, an additional arrangement for gas has been planned for the operation of gas-based stations, during upcoming high power demand months. India's power demand has been growing rapidly after the pandemic, with strong economic growth boosting demand from factories and the summer heat increasing household consumption.

Coal accounted for more than 73 percent of India's electricity generation by March 2023, while renewables, including wind and solar energy, accounted for more than 11 percent of


L N G
LIQUEFIED NATURAL GAS



solarnu energiju, čine više od 11 odsto ukupne proizvodnje. U međuvremenu, udeo energije na gas u ukupnoj proizvodnji pao je sa prosečnih 3 odsto u poslednjoj deceniji na manje od 2 odsto, a to se trenutno dešava zbog visokih cena prirodnog tečnog gasa.

KIŠA OMANULA

Očekuje se da će kiša, koja je ispod proseka, a koja tokom godišnjeg monsuna obično traje između juna i kraja septembra, rezultirati manjom proizvodnjom hidroelektrične energije u narednim mesecima, što će povećati pritisak na ukupno snabdevanje, saopštilo je resorno ministarstvo.


I dok se indijska elektroenergetska mreža suočavala sa minimalnim nestašicama tokom dana zbog obilne proizvodnje i dostupnosti solarne energije, snabdevanje je tokom noći bilo manje od potražnje. 



total generation. Meanwhile, the share of gas-fired energy in total production has fallen from an average of 3 percent in the last decade to less than 2 percent, and this is currently happening due to high prices of liquefied natural gas.

RAINFALL FAILED

It is expected that below-average rainfall which during the annual monsoon usually lasts between June and the end of September, will result in lower hydroelectricity production in the coming months, which will increase pressure on overall supply, the Ministry of Energy said in the note.

While India's power grid faced minimal shortages during the day due to abundant solar power generation and availability, supply fell short of demand during the night. 

TRANSFERA

TRANSPORT & LOGISTICS

VAŠ LOGISTIČKI PARTNER U ODRŽIVOM RAZVOJU

Već deset godina nastojimo da integrišemo ciljeve održivog razvoja u strateške ciljeve kompanije i transformišemo poslovanje primenom ekoloških rešenja u logistici.

www.transfera.com

Skladištenje pumpne hidroenergije

The Storage of Pumped Hydropower

Upotreba pumpnog skladištenja hidroenergije je od suštinskog značaja u trenutnim električnim mrežama, sa visokim udelom obnovljive energije

The use of pumped hydro energy storage is essential in current electricity grids, with a high proportion of renewable energy



S obzirom da skladištenje pumpne hidroenergije dobija na vrednosti tokom narednih godina, kao sredstvo za integraciju obnovljivih izvora u proizvodnju električne energije i lanac snabdevanja, potreban je metod za optimizaciju rasporeda i upravljanja ovim sredstvom.

Istraživači sa Univerziteta u Saragosi i Atalaia Generacion u Španiji rekli su da je „upotreba pumpnog skladištenja hidroenergije od suštinskog značaja u trenutnim električnim mrežama, sa visokim udelom obnovljive energije, jer omogućava optimizaciju korišćenja proizvedene energije i moguće smanjenje viška energetske pražnjenja”.

Dodali su da pored toga, ovaj sistem može da zameni kombinovane toplotne elektrane, koje zavise od uvoza gasa i proizvode visoke emisije CO₂.



As pumped hydro energy storage gains value over the coming years as a means of integrating renewables into the electricity generation and supply chain, a method for optimizing the deployment and management of this asset is needed.

Researchers from the University of Zaragoza and Atalaia Generacion in Spain said that „the use of pumped storage of hydropower is essential in current electricity grids, with a high share of renewable energy, as it allows the optimization of the use of produced energy and possible reduction of excess energy discharges”.

They added that, in addition, this system can replace combined heat power plants, which depend on gas imports and produce high CO₂ emissions.



Stoga su modelirali i primenili optimalni model upravljanja po satu, fotonaponskih i vetroelektrana povezanih na mrežu, integrisanih sa reverzibilnim pumpno-turbinskim jedinicama kako bi se maksimizirao mesečni operativni profit energetskog sistema i zadovoljila potražnja za električnom energijom.

Rezultate istraživanja podelili su časopisu "Journal of Energy Storage". Glavna otkrića studije su:

Model maksimizira korišćenje vetra i solarnih resursa. U polovini meseci u godini, više od 70 odsto potražnje za električnom energijom zadovoljavaju stohastički obnovljivi izvori i hidroelektrana, smanjujući zavisnost od mreže.

Akumulacija hidroenergije je ključna komponenta u upravljanju električnim sistemima. Tehnička ograničenja mreže povezana sa sigurnim radom elektroenergetskih sistema mogu uzrokovati odbijanje ili smanjenje tokom sati kada postoji velika količina proizvodnje obnovljive energije. Ova vrsta skladištenja smanjuje ove situacije.

Kombinovanjem jednog ili više obnovljivih izvora energije sa sistemom skladištenja, objekat stiče upravljački kapacitet, pored povećanja njegove efikasnosti i izravnavanja profila proizvodnje.

Integracija fotonaponskih izvora i izvora energije vetra i PHES smanjuje troškove kupovine energije na tržištu električne energije do 27% u poređenju sa slučajem bez sistema za skladištenje kako bi se zadovoljila potrebna potražnja za električnom energijom.

Nalazi potvrđuju da skladištenje igra ključnu ulogu u energetskoj tranziciji kako bi se osigurala sigurnost i stabilnost energetskih sistema sa većim udelom proizvodnje iz obnovljivih izvora, kažu autori.



Therefore, they modeled and implemented the optimal management model per hour, grid-connected PV and wind farms integrated with reversible pump-turbine units to maximize the monthly operating profit of the energy system and meet the electricity demand.

The research results were shared with the magazine Journal of Energy Storage. The main findings of the study are:

The model maximizes the use of wind and solar resources. In half of the months of the year, >70 percent of electricity demand is met by stochastic renewable sources and hydropower, reducing grid dependency.

The accumulation of hydropower is a key component in the management of electrical systems. Technical constraints of the grid associated with the safe operation of power systems can cause rejection or curtailment during hours when there is a large amount of renewable energy generation. This type of storage reduces these situations.

By combining one or more renewable energy sources with a storage system, the facility gains management capacity, in addition to increasing its efficiency and smoothing the production profile.

The integration of photovoltaic and wind energy sources and PHES reduces the cost of purchasing energy in the electricity market by up to 27% compared to the case without storage systems to meet the necessary electricity demand.

The findings confirm that storage plays a key role in the energy transition in order to ensure the security and stability of energy systems with a higher share of generation from renewable sources, the authors say.



Nova dimenzija avanture na točkovima

Baterija kapaciteta 48 volti i 14 ampersatnih časova integrisana je u okviru bicikla i može se lako izvaditi radi praktičnog punjenja



A New Dimension of an Adventure on Wheels

The battery with a capacity of 48 volts and 14 amp-hours is integrated in the frame of the bicycle and can be easily removed for practical charging



Svetski renomirani brend Lectric ponovo je pokazao da za avanture ne treba veliki budžet. Njihov najnoviji proizvod, XPeakFat – Tire E-BIKE, obećava izuzetnu svestranost i performanse, čineći svaku vožnju nezaboravnom avanturom.

XPeak je hrabro odstupanje od uobičajenih e-bicikala na rasklapanje, sa svojim robusnim dizajnom koji podseća na bicikl za planinarenje. Opremljen snažnim motorom i debelim gumama, vodi vas izvan granica grada, na staze na kojima niste mogli ni da zamislite da ga vozite. Tihi rad motora, svestrana baterija i brojni dodaci čine svaku avanturu još uzbudljivijom.

Što se tiče performansi, LectricXPeak pokreće snažan motor od 750 vati sa maksimalnom snagom od 1.310 vati, čime bicikl dostiže maksimalnu brzinu od 60 km/h i da radi u različitim režimima. Baterija kapaciteta 48 volti i 14 ampersatnih



The world-renowned brand Lectric has shown once again that adventures do not need a big budget. Their latest product, XPeakFat – Tire E-BIKE, promises exceptional versatility and performance, making every ride an unforgettable adventure.

The XPeak is a bold departure from the usual folding e-bikes, with its rugged design that resembles a mountain bike. Equipped with a powerful engine and fat tires, it takes you beyond the city limits, to tracks where you could not even imagine driving it. Quiet engine operation, a versatile battery and numerous accessories make every adventure even more exciting.

In terms of performance, the LectricXPeak is powered by a powerful 750-watt motor with a maximum power of 1,310 watts, allowing the bike to reach a top



časova integrisana je u okviru bicikla i može se lako izvaditi radi praktičnog punjenja.

XPeak opremljen je „gasi – palac“ funkcijom kao standardom, što omogućava da se koristi kao mali električni motor kada ste previše umorni za okretanje pedala.

Što se mehanike tiče, ovaj bicikl ima sedmosmerni pogon za brzo menjanje brzina i kotrlja se na 26-inčnim gumama za 180mm rotorima i ugrađenim LED svetlima za dodatnu bezbednost. Bicikl je prošao ISO M4210 – 10 testiranje, što ga svrstava među vrhunske električne planinske bicikle mnogih renomiranih brendova. Ovaj test osigurava da okvir, viljuška i druge komponente budu dovoljno izdržljive za vožnju izvan asfaltnih puteva.



speed of 60 km/h and operate in various modes. The battery with a capacity of 48 volts and 14 amp-hour is integrated in the frame of the bicycle and can be easily removed for practical charging.

The Xpeak is equipped with a, turn off by thumb' function as standard, allowing it to be used as a small electric motor when you are too tired to turn the pedals.

Mechanically, this bike has a seven-way drivetrain for quick shifting and rolls on 26-inch tires behind 180mm rotors and built-in LED lights for additional safety. The bike has passed ISO M4210 – 10 testing, which ranks it among the top electric mountain bikes of many renowned brands.

This test ensures that the frame, fork and other components are durable enough for off-road driving.



Elegancija

inspirisana prirodom.



Kao jedan od najbrže rastućih brendova na regionalnom tržištu kućnih aparata, Tesla nudi elegantne i kvalitetne uređaje koji olakšavaju živote, pružaju razne mogućnosti zabave, i omogućuju efikasniju i jednostavniju svakodnevicu.

Istražite ceo Tesla asortiman na tesla.info. Dobro došli u svet u kojem tehnologija pripada svima.

Tehnologija svima

TESLA



Spreman da postane stvarnost

Uzbudljiv koncept ima potencijal da postane stvarnost - otkrivamo znakove koji ukazuju da bi ovaj električni sportski automobil mogao zaživeti, možda čak i sa „manuelnim“ električnim prenosom

Ready to Become a Reality

An exciting concept has the potential to become a reality – we reveal signs that this electric sports car could come to life, perhaps even with a „manual“ electric transmission



Atraktivni električni sportski automobil *Toyota FT-Se concept*, koji je nedavno debitovao na Japan Mobility Show-u, ima potencijal da postane „dečački san“ u budućnosti.

Hideaki Iida, menadžer projekta za GR (Gazoo Racing) Design Group i glavni dizajner FT-Se koncepta, podelio je intrigantne informacije. Ističe da ovaj koncept deli istu baterijsku platformu sa *Lexus LF-ZC*, koji je već zvanično planiran za proizvodnju. Iako *Toyota* još nije potvrdila da će FT-Se postati stvaran automobil, Iida je bio izrazito uveren da će to biti slučaj nakon što se *Lexus* pojavi na tržištu.

Imajući u vidu da je lansiranje *Lexus* modela planirano za 2026. godinu, očekuje se a će *Toyota* to učiniti ubrzo nakon toga. Ovo predstavlja najubedljiviju potvrdu da postoji velika verovatnoća da ovaj sportski električni automobil zaživi. Kada analiziramo sve dostupne dokaze, postaje sve jasnije da FT-Se nije samo običan koncept. Od spoljašnjeg izgleda do unutrašnjosti, FT-Se se čini znatno bližim proizvodnji u poređenju sa mnogim drugim konceptima koje je *Toyota* predstavila na sajmovima. Na primer, *Land Cruiser Se* imao je prekrivene prozore, bez unutrašnjosti, dok se FT-Se čini znatno bližim finalnom proizvodu.

The attractive electric sports car *Toyota FT-Se concept*, which has recently debuted at the Japan Mobility Show, has the potential to become a „boy's dream“ in the future.

Hideaki Iida, a project manager for GR (Gazoo Racing) Design Group and a chief designer of the FT-Se concept, has shared some intriguing information. He points out that this concept shares the same battery platform with the *Lexus LF-ZC*, which has already been planned officially for production. Although *Toyota* has not confirmed yet that the FT-Se will become a real car, Iida has been very confident that it will be the case

once the *Lexus* appears in the market.

Bearing in mind that the launch of the *Lexus* model is planned for 2026, it is expected that *Toyota* will do so soon after that. This is the most convincing confirmation that there is a high probability that this sports electric car will come to life. When we analyze all the available evidence, it becomes increasingly clear that FT-Se is not just a simple concept. From the exterior to the interior, the FT-Se feels significantly closer to production in comparison with many other concepts *Toyota* has shown at fairs. For example, the *Land Cruiser Se* has covered windows, without the



TOYOTA FT-Se SPORT EV



Iida naglašava da je FT-Se nosilac potpuno novog dizajnerskog jezika koji će se predstaviti kao potpuno novi brend, potpuno različit od tradicionalnog pristupa. On demantuje bilo kakvu povezanost FT-Se sa modelima poput MR2 ili Supre, iako dele neke sličnosti u dizajnu. Osim toga, Iida nagoveštava da bi GR Performance Division, sa kojim saraduje, mogla biti odgovorna za ovaj automobil.

Nedavno su se pojavili znaci koji ukazuju da će FT-Se fobiti „manuelni“ prenos, nešto neobično za električne automobile, ali što bi sačuvalo taktički osećaj vožnje. Toyota želi da se FT-Se takmiči sa

modelima kao što su Porsche Boxter i Cayman, koji takođe planiraju prelazak na električnu energiju.

Hideaki nije mogao da pruži informacije o specifičnostima proizvodnje, težini i ceni FT-Se, ali mnogi znakovi ukazuju da Toyota ozbiljno razmatra stvaranje ovog sportskog EV-a. Dok čekamo zvaničnu potvrdu, ostaje nam da vidimo hoće li FT-Se postati stvarnost. Iako su mnogi EV-ovi nedavno doživeli značajna odlaganja, postoje mnogi razlozi za optimizam. Možda je baš FT-Se taj koji će započeti revoluciju električnih sportskih automobila.



interior, while the FT-Se seems much closer to the final product.

Iida emphasizes that the FT-Se is the bearer of a completely new design language that will be presented as a completely new brand, different from the traditional approach. He denies any connection of the FT-Se with models like the MR2 or Supra, although they share some design similarities. Additionally, Iida hints that GR Performance Division, with whom he cooperates, could be responsible for this car.

Recently, there have been signs that the FT-Se will feature a „manual“ transmission, something unusual

for an electric car, but which would preserve the tactile feel of driving. Toyota wants the FT-Se to compete with models such as the Porsche Boxter and Cayman, which are also planning to switch to electric energy.

Hideaki Iida could not provide information on the production specifics, weight and price of the FT-Se, but many signs indicate that Toyota is seriously considering the creation of this sports EV. While we wait for official confirmation, it remains to be seen if the FT-Se will become a reality. Although many EVs have recently experienced significant delays, there are many reasons for optimism. Perhaps, it is the FT-Se that will start the electric sports car revolution.



Bioekonomija

Bioeconomy as a Path to Sustainability

Raznolike strategije,
delikatni balans i revolucija
uzrokovanja promena

Various strategies, delicate balance and
the revolution of causing change



U vrtlogu ekoloških izazova, bioekonomija izranja kao putokaz, spajajući svetove očuvanja i ekonomske dinamike. Ova evolutivna sila vodi nas ka održivijem sutrašnjem svetu.

U eri brzih promena klime, finansijske institucije transformišu svoje pristupe, uključujući rizike biodiverziteta u svoje investicione modele. Ova promena smera kapitala oblikuje budućnost industrija, promovišući održivi razvoj i svest o prirodnim resursima.

U neumornoj simfoniji ekološke održivosti, bioekonomija se uspinje kao svetionik nade, povezujući odgovorno upravljanje prirodnim bogatstvima s vizijom snažnog ekonomskog napretka. Ovaj preobražajni pristup izranja iz dubina biološkog znanja, tkajući delikatnu harmoniju između ekonomske dobiti i prirodne ravnoteže.

Bioekonomija



Raznolike strategije bioekonomije zapljuskuju nas u tri jasno definisane forme, svaka oblikujući svoju stazu na širokom platnu održivog razvoja. Ekološko-ekonomska bioekonomija hrli ka uspostavljanju sinergije između ekonomskog blagostanja i ekološke postojanosti. Nasuprot tome, glavna bioekonomija žarište stavlja na iskorišćavanje bioloških resursa u ekonomskom svetlu, posebno u domenima poljoprivrede i biotehnologije. S druge strane, socio-

biodiverzitetna bioekonomija duboko podržava očuvanje biodiverziteta, lokalnu zajednicu i zaštitu autohtonog znanja.

Srce bioekonomske vizije ključ je za očuvanjem biodiverziteta, tražeći promišljenu raspodelu zemljišta radi čuvanja ovih dragocenih resursa. Ipak, ovo postavlja kompleksne dileme između iskorišćavanja zemljišta u ekonomske svrhe i njegove neprocenjive vrednosti u kontekstu očuvanja. Državna dotacija, privatne donacije i inventivni podsticaji postaju kamen temeljac podrške za očuvanje biodiverziteta, obećavajući dugoročne beneficije kroz stabilnost ekosistema i nezamenljive usluge.

Konzervacija zemljišta odvija se kroz dva ključna pristupa - deljenje i čuvanje zemljišta. Kombinujući poljoprivredu i očuvanje u istom domenu, deljenje zemljišta hrabro se suočava s izazovima poput fragmentacije staništa i konkurencije za resurse. Suprotno tome, čuvanje zemljišta određuje odvojena područja za očuvanje, minimalizirajući uticaj na proizvodnju hrane. Upotreba javnih sredstava u strategijama čuvanja zemljišta postaje ključna za balans između očuvanja biodiverziteta i imperativa proizvodnje hrane.

U žiži bioekonomije, revolucionarni rad objavljen 2023. u časopisu Sustainability osvetljava inovativne metode istraživanja.

Bioeconomy



In the vortex of environmental challenges, the bioeconomy is emerging as a signpost, bridging the worlds of conservation and economic dynamism. This evolutionary force is leading us towards a more sustainable future world

In an era of rapid climate change, financial institutions are transforming their approaches, incorporating biodiversity risks into their investment models. This shift in the direction of capital is shaping the future of industries, promoting sustainable development and

awareness of natural resources
In the tireless symphony of ecological sustainability, the

bioeconomy rises as a beacon of hope, linking the responsible management of natural resources with a vision of strong economic progress. This transformative approach emerges from the depths of biological knowledge, weaving delicate harmony between economic profit and natural balance.

Various bioeconomy strategies wash over us in three clearly defined forms, each carving its own path on the broad canvas of sustainable development. The ecological-economic bioeconomy rushes towards establishing a synergy between economic well-being and ecological sustainability. In contrast, the mainstream bioeconomy focuses on the exploitation of biological resources in the economic light, especially in the domains of agriculture and biotechnology. On the other hand, the socio-biodiversity bioeconomy deeply supports the conservation of biodiversity, the local community and the protection of indigenous knowledge.

The heart of the bioeconomic vision calls for the conservation of biodiversity, seeking thoughtful allocation of land to preserve these precious resources. However, this raises complex dilemmas between the exploitation of land for economic purposes and its inestimable value in the context of conservation.

Bioekonomija Bioeconomy



Fokus je na složenoj mreži lanca vrednosti piraruca, ribe ukotvljene u srce Amazonske prašume. Ovaj metod koristi indikatore poput ekološkog uticaja, ekonomske održivosti i socijalnih dobiti, dopunjene intervjuima koji rasvetljavaju perspektive lokalne zajednice. Ovaj pristup savršeno se uklopilo u socio-biodiverzitetnu bioekonomiju, ne samo podupirući angažman i jačanje lokalne zajednice, već i pridonoseći ne samo ekonomskoj održivosti, već i očuvanju biodiverziteta.

Ekonomske konsekvence biodiverziteta pletu se kroz različite industrijske sfere poput poljoprivrede, farmacije i turizma. Finansijske institucije, zbijajući svoje redove, sada uzimaju u obzir rizike biodiverziteta u svojim investicionim odlukama. Ovo uključuje analizu lanca snabdevanja i uticaja operacija kompanija na biodiverzitet, mereno kroz prizmu njihove finansijske performanse. Valovi investicionih

odluka snažno utiču na industrije koje su vezane za biološke resurse, oblikujući put ka očuvanju, naporima za obnovu i istraživanjima unutar bioekonomije.

Bioekonomija cveta u svetlu rastućih ekoloških izazova i munjevitih promena globalne klime. Bilo da težimo postizanju ekološko-ekonomske ravnoteže, eksploataciji resursa u glavnoj struji ili podršci socio-biodiverzitetnom pristupu, bioekonomija osigurava put kroz lavirinte savremenog sveta. Čuvanje biodiverziteta nesumnjivo zauzima središnje mesto, zahtevajući metodične strategije konzervacije podržane snažnom finansijskom podrškom. Dok finansijske institucije sve više uključuju biodiverzitetne rizike u svoje investicione modele, bioekonomija se ne samo ispostavlja kao svetionik nade, već kao konkretna garancija održivosti usred globalnih izazova i varljive prirode naše životne sredine.



Government grants, private donations and inventive incentives are becoming cornerstones of support for biodiversity conservation, promising long-term benefits through ecosystem stability and irreplaceable services.

Land conservation takes place through two key approaches - land sharing and conservation. By combining agriculture and conservation in the same domain, land sharing bravely confronts challenges such as habitat fragmentation and competition for resources. Conversely, land conservation designates separate areas for conservation, minimizing the impact on food production. The wise use of public funds in land conservation strategies is becoming crucial for the balance between biodiversity conservation and food production imperatives.

In the spotlight of the bioeconomy, a groundbreaking paper published in 2023 in the journal Sustainability sheds light on innovative research methods. The focus is on the complex web of the pirarucu value chain, a fish anchored in the heart of the Amazon rainforest. This method uses indicators such as environmental impact, economic sustainability and social benefits, complemented by interviews that shed light on local community perspectives. This approach fits perfectly into the socio-biodiversity bioeconomy, not only supporting the engagement and strengthening of the local community, but also contributing to economic sustainability and biodiversity conservation as well.

The economic consequences of biodiversity weave through different industrial spheres such as agriculture, pharmaceuticals, and tourism. Financial institutions, connecting themselves closely, are now taking into account biodiversity risks in their investment decisions. This includes an analysis of the supply chain and biodiversity impact of companies' operations, measured through the prism of their financial performance. Waves of investment decisions strongly influence industries related to biological resources, shaping the path to conservation, restoration efforts, and research within the bioeconomy.

The bioeconomy is flourishing in the light of growing environmental challenges and rapid changes in the global climate. Whether we strive to achieve ecological-economic balance, exploit resources in the mainstream or support a socio-biodiversity approach, the bioeconomy provides a path through the labyrinths of the modern world. Preserving biodiversity undoubtedly occupies the central place, requiring methodical conservation strategies backed by strong financial support. As financial institutions increasingly incorporate biodiversity risks into their investment models, the bioeconomy is not only emerging as a beacon of hope, but as a concrete guarantee of sustainability amidst global challenges and the deceptive nature of our environment.



Porast nivoa mora ugrožava njegove stanovnike

Svaka šesta ugrožena
i zaštićena vrsta
trpi posledice

Every sixth endangered and protected
species suffers the consequences

Sea Level Rise Threatens Its Inhabitants



Porast nivoa mora postaje sve ozbiljnija pretnja za mnoge vrste životinja, kako kopnene tako i morske.

Često se misli da su morske vrste otporne na ovu promenu, ali to nije tačno.

Floridski jeleni, kornjače i havajske monah foke, ugrožene vrste prema Zakonu o zaštiti ugroženih vrsta u SAD-u, suočavaju se sa gubicima ključnih staništa zbog porasta nivoa mora. Ove životinje žive na teritoriji sa nadmorskom visinom manjom od tri stope iznad nivoa mora. Iako su dobri plivači, nisu prilagođeni da prežive ako im se kopneno stanište potopi usled porasta nivoa mora.

Pre pola veka, lov i gubitak staništa doveli su ove vrste na ivicu istrebljenja, ali su se oporavili zahvaljujući Zakonu o zaštiti ugroženih vrsta iz 1973. godine.

Međutim, njihova budućnost je i dalje neizvesna zbog prilične opasnosti od porasta nivoa mora.

NA UDARU ČAK 233 VRSTE ŽIVOTINJA

Prema izveštaju Centra za biološku raznolikost, porast nivoa mora usled klimatskih promena pretnja je za čak 233 vrste pod federalnom zaštitom u 23 priobalne države SAD-a.

To znači da svaka šesta ugrožena i zaštićena vrsta u SAD trpi posledice porasta nivoa mora, a floridski jeleni su jedna od pet najugroženijih.

Havajske monah foke i tamošnje kornjače, provode najveći deo svog života u okeanu, međutim, njihova reprodukcija zahteva obale koje sada predstavljaju krizna područja.

Kornjače prave gnezda na plažama na atlantskim obalama Floride, Južne Karoline, Džordžije i Severne Karoline, kao i na obalama Floride i Alabame u Meksičkom zalivu.



Sea level rise is becoming an increasingly serious threat to many species of animals, both terrestrial and marine.

Marine species are often thought to be resistant to this change, but this is not true. Florida white-tailed deer, turtles and Hawaiian monk seals, endangered species under the US Endangered Species Act, face loss of key habitats due to sea level rise. These animals live in a territory with an altitude of less than three feet above sea level. Although they are good swimmers, they are not adapted to survive if their land habitat is submerged due to sea level rise.

Half a century ago, hunting and habitat loss brought the species to the brink of extinction, but they recovered thanks to the Endangered Species Act of 1973. However, their future is still uncertain due to the considerable risk of sea level rise.

EVEN 233 ANIMAL SPECIES ARE ENDANGERED

According to a report by the Center for Biological Diversity, sea level rise due to climate change threatens as many as 233 federally protected species in 23 US coastal states.

This means that one in six endangered and protected species in the US is suffering from the effects of sea level rise, and Florida white-tailed deer are one of the five most threatened.

Hawaiian monk seals and Hawaiian turtles spend most of their lives in the ocean, however, their reproduction requires coastlines that are now crisis areas.

Sea turtles nest on beaches of the Atlantic coasts of Florida, South Carolina, Georgia, and North Carolina, as well as on coasts of Florida and Alabama in the Gulf of Mexico.



The consequences of climate change threaten not only animals, but also people living in coastal areas



Posledice klimatskih promena ne ugrožavaju samo životinje, već i ljude koji žive u priobalnim područjima



FOKE SUOČENE SA NIZOM OPASNOSTI

Havajske monah foke su endemska vrsta za Havaje i suočavaju se sa sličnim izazovima. Ova vrsta je među najugroženijim fokama na svetu i pati zbog nedostatka hrane, zaplitanja u ribarske mreže i napada ajkula. Ključno za opstanak ove vrste je očuvanje plaža na kojima se rađaju i odgajaju mladunci.

Veliki deo ostrva u severozapadnom havajskom arhipelagu ima nadmorsku visinu manju od 1,98 metara, a erozija plaža usled porasta nivoa mora već je odnela jedno od mesta gde ove foke rađaju mladunce.



SEALS FACE A RANGE OF DANGERS

Hawaiian monk seals are an endemic species to Hawaii and face similar challenges. This species is among the most endangered seals in the world and suffers from the lack of food, entanglement in fishing nets and shark attacks. The key to the survival of this species is the preservation of the beaches where the pups are born and raised.

Much of the island in the northwestern Hawaiian archipelago has an elevation of less than 1.98 meters, and beach erosion due to sea level rise has already taken away one of the places where these seals give birth.



NIVO MORA SE BRZO POVEĆAVA

Kada sagledamo sve relevantne činjenice, zaključujemo da porast nivoa mora predstavlja ozbiljnu pretnju kopnenim i morskim vrstama širom sveta. Prema predviđanjima stručnjaka iz ove oblasti, nivo mora će se povećavati sve brže. Zato je neophodno preduzeti mere zaštite ovih ugroženih životinja i njihovih staništa.

Preseljenje vrsta na druga područja unutar njihovog geografskog opsega, introdukcija u nove oblasti, premeštanje pojedinaca u zoo vrtove, ili „bankiranje“ njihove DNK neka su od rešenja koja se razmatraju.

Proces rešavanja ovog problema zahteva ne samo logistiku, već i etiku i „sveobuhvatan odgovor društva“.

Ne smemo da izostavimo da ova posledica klimatskih promena ne ugrožava samo životinje, već i ljude koji žive na obalnim područjima, te je izuzetno važna sinergija radi rešavanja ovog problema.



SEA LEVEL IS RISING FAST

When we look at all the relevant facts, we conclude that sea level rise poses a serious threat to terrestrial and marine species around the world. According to the predictions of experts in this field, the sea level will rise faster and faster. That is why it is necessary to take measures to protect these endangered animals and their habitats.

Moving species to other areas within their geographic range, introducing them to new areas, moving individuals to zoos, or „banking“ their DNA are some of the solutions being considered.

The process of solving this problem requires not only logistics, but also ethics and a „comprehensive response of society“.

We must not leave out that this consequence of climate change threatens not only animals, but also people living in coastal areas, and synergy is extremely important in order to solve this problem.



Put ka održivosti počinje u IEE corporation-u

Path to sustainability begins at IEE Corporation

Mi smo vaš globalni partner za razvoj investicija u oblasti čiste energije. Proteklih 15 godina, posvećeni smo stvaranju inovativnih rešenja za budućnost u okviru čiste energije i racionalne upotrebe resursa. Od hidro, vetro i solarnih postrojenja do termoenergetike i naprednih pametnih infrastrukturnih projekata, industrijskih rešenja bez emisije CO₂, naša referenca govori sve.

We are your global partner for clean energy investment development. Over the past 15 years, we have dedicated to shaping innovative solutions for the future within clean energy and rational resource usage. From hydro, wind, and solar plants to thermal energy systems and advanced smart infrastructure projects, carbon-free industrial solutions, our portfolio speaks for itself.

Uticaj klime na zdravlje ljudi

„Sve veći rizici od klimatskih promena ugrožavaju same temelje ljudskog zdravlja“, piše u izveštaju uglednog stručnog magazina

The Influence of Climate on Human Health

„The growing risks of climate change threaten the very foundations of human health,“ it is written in a report of a respected professional magazine



Pre osam godina, medicinski časopis Lancet je počeo da prikuplja najnovija istraživanja o tome kako klimatske promene utiču na zdravlje ljudi. Bio je to prvi koordinisani napor da se istaknu naučna otkrića o zdravstvenim posledicama klimatskih promena, objavljena u nadi da će ova tema zauzeti centralnije mesto u globalnim pregovorima o klimi. Godišnji izveštaji Lancet-a o ovoj temi, koji sumiraju istraživanja koja je sprovelo na desetine naučnika iz vodećih institucija širom sveta, postaju sve alarmantniji. Naime, svako malo slušamo o tome kako vreline odnose živote ljudi, dok požaru bujaju i temperature rastu. Ovog novembra, Lancet je objavio svoj najmračniji scenario do sada.

Oslanjajući se na istraživanje objavljeno 2022. i preliminarne podatke o rekordnim toplotnim talasima i poplavama u 2023. godini, Lancet Countdown on Health and Climate Change upozorava na „nepovratne štete“ nastale zbog ograničenog uspeha u ublažavanju izvora globalnog zagrevanja, prvenstveno zbog sagorevanja fosilnih goriva.

„Sve veći rizici od klimatskih promena ugrožavaju same temelje ljudskog zdravlja“, piše u izveštaju.



Eight years ago, the *Lancet* medical journal began collecting the latest research on **how climate change affects human health**.

It was the first coordinated effort to highlight scientific findings about the health consequences of climate change, published in the hope that the topic will take a more central place in global climate negotiations. The *Lancet's* annual reports on the subject, which summarize research conducted by dozens of scientists from leading institutions around the world, are becoming increasingly alarming. Namely, every now and then we hear about how the heat takes people's lives away, while fires rage and temperatures rise. This November, the *Lancet* has published its darkest scenario so far.

Based on the research published in 2022 and preliminary data on record heat waves and floods in 2023, the *Lancet Countdown on Health and Climate Change* warns of „**irreversible damage**“ caused by **limited success in mitigating the sources of global warming**, primarily fossil fuel burning.

„The growing risks of climate change threaten the very foundations of human health,“ the report says.



EKSTREMNA TOPLOTA I NESTAŠICA HRANE

Stručnjaci kažu da su zdravstveni uticaji povezani sa ekstremnom toplotom i nesigurnošću po pitanju hrane - podstaknuti sušom i poplavama - među najzabrinjavajućim događajima koji su dokumentovani u novom izveštaju. Godišnji smrtni slučajevi, uzrokovani toplotom između 2013. i 2022. godine, bili su za 85 procenata veći nego u periodu između 1991. i 2000. godine. To je, naime, dvostruko više nego što bi se dogodilo da zagrevanje planete nije izazvano ljudskim faktorom. Globalna kopnena površina pogođena sušom između 1951. i 1960. - 18 procenata - porasla je na 47 procenata između 2013. i 2022, a spajanje toplote izazvane klimom i suše dovelo je 127 miliona ljudi u opasnost od umerene ili teške nesigurnosti u snabdevanju hranom.

Marina Romanelo, izvršna direktorka Lancet Countdown-a, nazvala je ovaj podatak o nesigurnosti hrane jednim od „najšokantnijih“ ishoda ovogodišnjeg izveštaja. Za razliku od prethodnih, izveštaj za

2023. uključuje projekcije načina na koji će klimatske promene uticati na zdravlje ljudi, prema scenariju u kojem se globalne temperature povećavaju u proseku za 2 stepena Celzijusa u odnosu na predindustrijske nivoe. Takvo zagrevanje bi dovelo do povećanja godišnjih smrtnih slučajeva od toplote za 370 odsto, i izložilo bi dodatnih 525 miliona ljudi riziku od umerene do teške nesigurnosti vezane za ishranu. Dodatno, isti ishod bi potencijalno podstakao povećanje od 37 odsto u širenju smrtonosnog virusa denga koji prenose komarci.



EXTREME HEAT AND FOOD SHORTAGE

Experts say health impacts associated with extreme heat and food insecurity - fueled by drought and flooding - are among the most worrying events documented in the new report. Annual heat-related deaths between 2013 and 2022 were 85 percent higher than between 1991 and 2000. That is, namely, twice as much as would have happened if the warming of the planet had not been caused by the human factor. The global land area affected by drought between 1951 and 1960 - 18 percent - rose to 47 percent between 2013 and 2022, and the combination of climate-induced heat and drought has put 127 million people at risk of moderate or severe food insecurity.


Marina Romanello, the executive director of the Lancet Countdown, called this data on food insecurity one of the „most shocking“ outcomes of this year's report. Unlike previous reports, the 2023 report includes projections of how climate change will affect human health, under a scenario in which global temperatures increase by an average of 2 degrees Celsius compared to pre-industrial levels. Such warming would increase annual heat deaths by 370 percent, and put additional 525 million people at risk of moderate to severe food insecurity. Additionally, the same outcome would potentially fuel a 37 percent increase in the spread of the deadly mosquito-borne dengue virus.





NEOPHODNOST DANA ZDRAVLJA

U izveštaju se napominje i da je smanjenje svetske zavisnosti od fosilnih goriva siguran način da se umanje budući efekti klimatskih promena na javno zdravlje. Trenutno, manje od 1 procenta međunarodne potrošnje za prilagođavanje klimi – usmereno je na finansiranje zdravstvenih projekata. Dakle, to je pitanje koje iziskuje mnogo više ulaganja i sredstava.


Inače, Lancet Countdown se objavljuje svake godine uoči godišnje konferencije Ujedinjenih nacija o klimi COP, odgovorne za izradu Pariskog sporazuma i drugih međunarodnih klimatskih sporazuma. Izveštaj se objavljuje baš u tom vremenskom periodu kako bi podstakao govornike da razgovaraju o aktuelnim temama pomenutim u Lancet-u. Ovogodišnji COP28, koji se održao u Dubaiju krajem novembra, prvi put u istoriji je predstavio Dan zdravlja, što je signal da preklapanje klime i zdravlja konačno postaje više od „ležerne teme“ za diskusiju. 

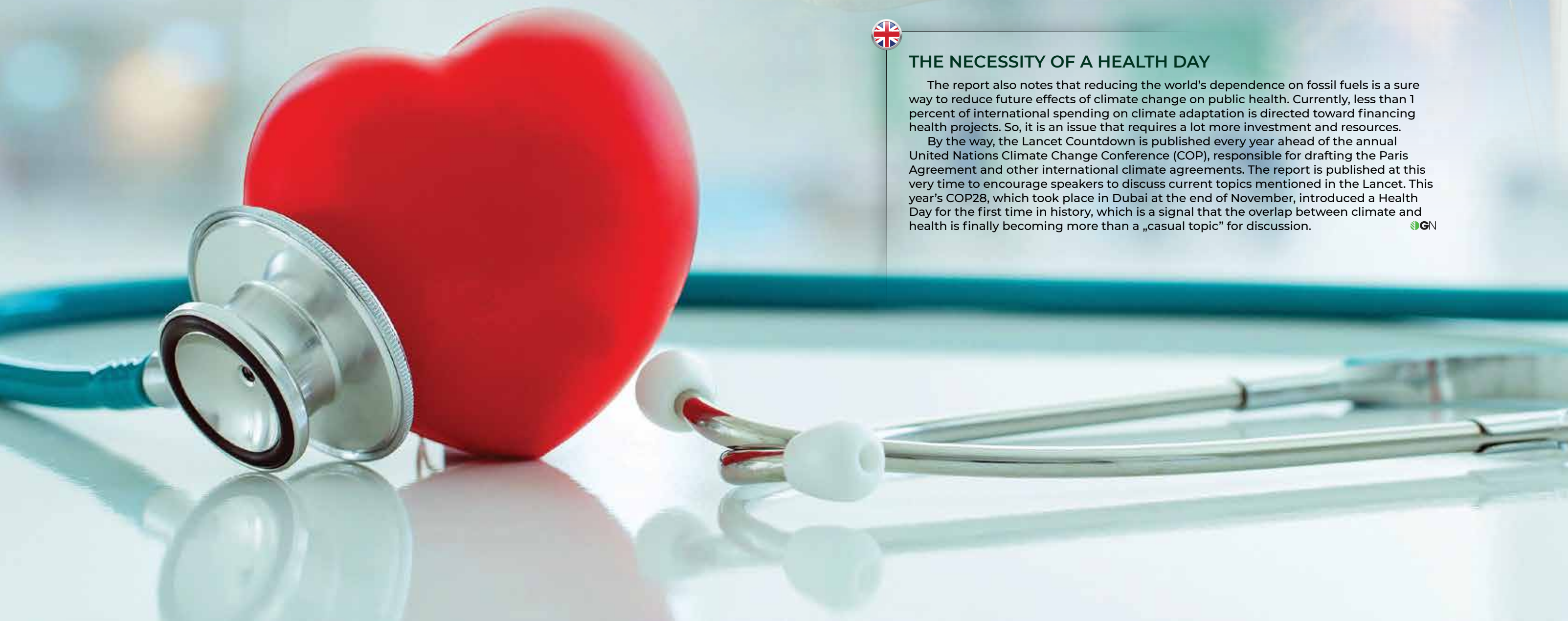
U izveštaju se napominje i da je smanjenje svetske zavisnosti od fosilnih goriva siguran način da se umanje budući efekti klimatskih promena na javno zdravlje



THE NECESSITY OF A HEALTH DAY

The report also notes that reducing the world's dependence on fossil fuels is a sure way to reduce future effects of climate change on public health. Currently, less than 1 percent of international spending on climate adaptation is directed toward financing health projects. So, it is an issue that requires a lot more investment and resources.

By the way, the Lancet Countdown is published every year ahead of the annual United Nations Climate Change Conference (COP), responsible for drafting the Paris Agreement and other international climate agreements. The report is published at this very time to encourage speakers to discuss current topics mentioned in the Lancet. This year's COP28, which took place in Dubai at the end of November, introduced a Health Day for the first time in history, which is a signal that the overlap between climate and health is finally becoming more than a „casual topic“ for discussion. 



Mikroplastika i ekološki alarmi

U poslednjih nekoliko godina, modna industrija se našla pod sve snažnijim mikroskopom javnosti zbog svoje ključne uloge u ekološkoj degradaciji, naročito u kontekstu zagađenja mikroplastikom. Sa zavidljivim 70% odevnih komada brze mode izrađenih od sintetičkih materijala poput poliestera, najlona i akrila, postavlja se crveni alarm za našu okolinu. Ovi plastikom bazirani materijali, mada pristupačni i ekonomični, predstavljaju monumentalnu pretnju našem ekosistemu budući da se ne razgrađuju.

Mikroplastike, tačnije, te sitne čestice plastike veličine do pet milimetara, slobodno lutaju tokom proizvodnje sintetičke odeće i još se više otpuštaju tokom pranja ovih komada u mašini za veš. Rezultat? Siva voda, ta tajnovita tečnost iz mašina za pranje veša i sušilica, ističe se kao glavni izvor mikroplastičnog zagađenja. Dr. Liam Morrison, mikroplastični guru sa Univerziteta u Galveju, naglašava da značajan deo mikroplastika u našem okruženju upravo potiče iz pranja sintetičke odeće.

Sve više postaje očigledno da mikroplastike imaju destruktivan uticaj na okolinu i ljudsko zdravlje. Ove mikročestice kontaminiraju vodena tela, što predstavlja neposrednu pretnju vodenom životu. Posebno je alarmantno to što ribe postaju žrtve ovih mikrovlakana, konzumirajući ih kao hranu, što ima katastrofalne posledice po njihovu dobrobit. Zapanjujuće studije otkrivaju da naša odeća svake godine oslobađa oko pola miliona tona mikrovlakana u okean, što je jednakovredno bacanju više od 50 milijardi plastičnih boca.

Rešavanje ove ekološke krize zahteva dvostruki pristup. Dr. Morrison ističe potrebu za sistemskim promenama u odevnoj industriji, gde se zagovaraju održive metode proizvodnje i materijali. Zavisnost industrije od jeftinih, ne-biorazgradivih sintetičkih tkanina podstakla je eksploziju brze mode, stvarajući imperativ za brendove da prihvate ekološki prihvatljive alternative.

Microplastics and Environmental Alarms

In recent years, the fashion industry has come under an increasingly strong public microscope due to its key role in environmental degradation, particularly in the context of microplastics pollution. With a staggering 70% of fast fashion garments made from synthetic materials such as polyester, nylon and acrylic, a red alert is being raised for our environment. These plastic-based materials, although affordable and economical, pose a monumental threat to our ecosystem since they do not degrade.

Microplastics, more precisely, those tiny particles of plastic up to five millimeters in size, roam freely during the production of synthetic clothing, and they are released even more during the washing of these pieces in the washing machine. What is the result? Greywater, that mysterious liquid from washing machines and dryers, stands out as a major source of microplastics pollution. Dr. Liam Morrison, a microplastics guru from the University of Galway, emphasizes that a significant part of microplastics in our environment comes from washing synthetic clothes.

It is becoming increasingly obvious that microplastics have a destructive impact on the environment and human health. These microparticles contaminate water bodies, posing an immediate threat to aquatic life. It is particularly alarming that fish become victims of these microfibers, consuming them as food, which has disastrous consequences for their well-being. Astounding studies reveal that our clothes release around half a million tonnes of microfibers into the ocean every year, which is equivalent to throwing away more than 50 billion plastic bottles.

RELEASES
MICROPLASTICS
DURING WASHING





Ali to nije samo odgovornost industrije; potrošači takođe imaju ključnu ulogu u rešavanju problema. Podržava se kupovina odeće od prirodnih materijala poput organskog pamuka, lana i konoplje umesto sintetičkih tkanina. Ovi materijali ne samo da su biorazgradivi, već i minimalizuju oslobađanje mikroplastika tokom upotrebe.

Međutim, poziv na promene ne sme biti ograničen samo na potrošače, već mora prožeti celu modnu industriju. Brza moda, sa svojim vrtoglavim ciklusima proizvodnje i mentalitetom brzog odbacivanja odeće, pretvorila je modni pejzaž u ozbiljnu ekološku opasnost. Ova industrija, vredna 3 milijarde dolara, uzdiže se kao drugi najzagađujući sektor na svetu, odmah iza naftne industrije.

Zahtev za reformom industrije podvučen je uznemirujućom stvarnošću modnog otpada. Čak 65 milijardi odevnih komada završava u deponijama svake godine, stvarajući neverovatnih 80 milijardi novih komada godišnje. Sintetička vlakna, dominantna u brzom modi, odolevaju biodegradaciji i mogu preživeti u deponijama do čitavih 200 godina.

Rešavanje ovog zagađenja mikroplastikom zahteva prelazak na održive prakse u modnoj industriji. Potrošači su pozvani da podrže eko-svesne brendove koji favorizuju ekološki prihvatljive materijale i proizvodne metode. Brza moda se sada nalazi na raskrsnici gde njen ekološki uticaj zahteva hitnu i zajedničku akciju. I industrijski akteri i potrošači imaju moć da izazovu promene, bilo kroz održive metode proizvodnje ili kroz promišljene kupovne navike.

Put ka održivoj i ekološki prihvatljivoj budućnosti mode zahteva kolektivno posvećenje očuvanju naše planete i njenih delikatnih ekosistema. Svi smo pozvani da preuzmemo odgovornost, jer je reč o više od mode - to je pitanje opstanka naše planete.



Solving this environmental crisis requires a dual approach. Dr. Morrison highlights the need for systemic changes in the clothing industry, where sustainable production methods and materials are advocated. The industry's dependence on cheap, non-biodegradable synthetic fabrics has fueled the explosion of fast fashion, creating an imperative for brands to embrace environmentally friendly alternatives.

But it is not just the industry's responsibility; consumers also play a key role in solving the problem. Buying clothes made from natural materials like organic cotton, linen and hemp instead of synthetic fabrics is encouraged. These materials are not only biodegradable, but also minimize the release of microplastics during the use.

However, the call for change must not be limited to consumers, but must permeate the entire fashion industry. Fast fashion, with its dizzying production cycles and throw-away mentality, has turned the fashion landscape into a serious environmental hazard. This \$3 billion industry ranks as the second most polluting sector in the world, just behind the oil industry.

The demand for industry reform is underscored by the disturbing reality of fashion waste. As many as 65 billion pieces of clothing end up in landfills each year, creating whopping 80 billion new pieces annually. Synthetic fibers, dominant in fast fashion, resist biodegradation and can survive in landfills for up to 200 years.

Addressing this microplastics pollution requires a shift to sustainable practices in the fashion industry. Consumers are encouraged to support eco-conscious brands that favor environmentally friendly materials and production methods. Fast fashion is now at a crossroads where its environmental impact demands urgent and collective action. Both industry players and consumers have the power to drive change, whether through sustainable production methods or thoughtful purchasing habits.

The path to a sustainable and eco-friendly fashion future requires collective commitment to preserving our planet and its delicate ecosystems. We are all called to take responsibility, because it is more than fashion - it is a matter of the survival of our planet.



AIK  **Banka**
domaća i jaka



Čuvajmo Planetu!

Tu gde ste vi, tu su naši ljudi.



Telekom Srbija