



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURU

Stanje in izzivi v energetiki

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Infrastrukturna paradigma: Elektrika je energija prihodnosti

	Energija	Transport	Informatika
19. stoletje	premog 	vlak 	telegraf 
20. stoletje	nafta 	avto 	telefon 
21. stoletje	elektrika 	avtonomno evozilo 	internet (IoT) 



Slovenija danes



Nek
Hidroelektrarne
Plinovodi
Teš 4 in 5
LB
Maxi
Republ. Rač. Center
Avtocetse
Elektrifikacija železnice
Luka koper – kontejnerski promet
Hoteli – bernardin, metropol, bled



Made in 1970



Energetska trilema je osnovni princip snavanja energetike prihodnosti (NEPN, EKS, EZ, ...)



Zanesljivost oskrbe = strateška samozadostnost

Okoljska sprejemljivost = brezogljičnost, sonaravnost

Dostopnost = konkurenčnost



Zanesljivost oskrbe, skoraj na vrhu v svetovnem merilu (vir WEC)

	Index rank	Country	Balance score	Energy security	Energy equity	Environmental sustainability
2018	6	Slovenia	AAB	2	33	58
2017	10	Slovenia	AAB	2	31	43
2016	12	Slovenia	AAB	2	25	44
2015	13	Slovenia	AAB	3	26	47

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- varnost in zanesljivost oskrbe z energijo (Energy Security),
- enakopravnost in cenovna dostopnost energije (Energy Equity) in
- okoljska trajnost (Environmental Sustainability).

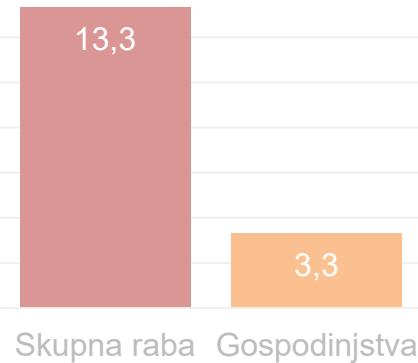




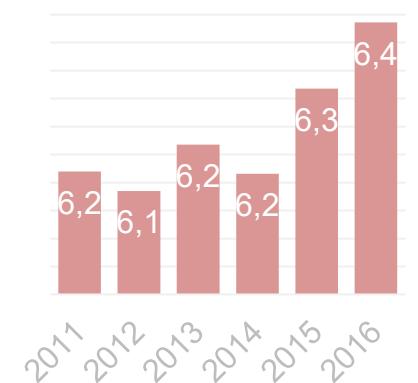
Infrastruktura, ki odgovarja na izzive prihodnosti – 5D megatrendi

- **Digitalizacija** – proces premika k digitalnemu poslovanju je ključen za transformacijo podjetij in državne uprave. Digitalne tehnologije spreminja poslovne modele, zagotavljajo nove prihodkovne priložnosti z večjo dodano vrednostjo
- **Dekarbonizacija** – zmanjšanje ogljičnega odtisa na strani proizvodnje energije in na strani rabe. Dekarbonizacija ne sme zmanjšati zanesljivosti oskrbe. Proizvodnjo usmeriti k OVE in jedrski energiji. Sektor rabe okrepiti z e-mobilnostjo, ogrevanje s TČ
- **Demokratizacija** – zagotoviti vlogo aktivnega odjemalca. Aktivni odjemalec lahko izbira med storitvami samooskrbe, baterijskega shranjevanja,
- **Decentralizacija** – omogočiti vključevanje razpršenih virov v elektroenergetski sistem
- **Deregulacija** – z regulacijo po potrebi usmerjati, ne pa definirati

Raba EE [TWh]

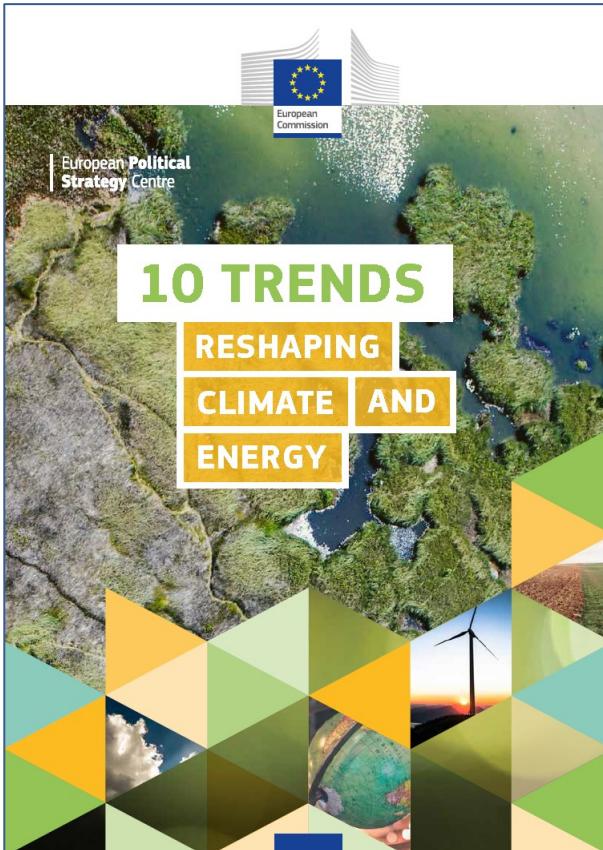


Raba EE na prebivalca [MWh/preb]





Razogljičenje – osnovno vodilo



TREND 2

A CHANGING ENERGY MIX

Renewables are growing fastest even as fossil fuels continue to dominate

- Buoyed by an ambitious policy and regulatory framework, as well as binding targets, the EU continues to lead the penetration of renewables, with renewable energy sources now representing at least 17% of final energy consumption in Europe – on track towards the 2020 target of 20%.¹³
- This growth has enabled a reduction in the overall share of fossil fuels in the EU's gross energy consumption: from 81% in 1995 to 72.6% in 2016 – even though absolute figures remained constant. Renewable power generation rates in Europe are expected to accelerate further, reaching 1,000 TWh by 2023.
- At a global level, the share of renewables in total energy demand is limited to 10.4%, while fossil fuels have maintained a constant share of 81%.¹⁴
- Nonetheless, global renewables penetration is expected to grow by one-fifth in the next five years, reaching 12.4% in 2023. Much of this growth will be driven by the power sector, where a further 920 gigawatts of renewable capacity is expected to be installed by 2023, bringing the total renewable capacity in the EU of 412 gigawatts in 2016. Most of this growth will take place in China, which is expected to add more renewable power than the EU and US combined over the next 20 years.¹⁵

BREAKING EVEN

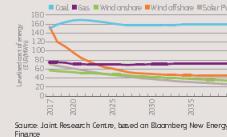
Stronger growth in renewable energy is buoyed by the fact that both solar and wind power are becoming significantly more competitive. Costs of solar have fallen by 70% since 2010.¹⁶

Grid parity for wind power, i.e. the moment when these technologies can compete without subsidies, is imminent – or already happening in some countries, like Germany.

FACTORS HOLDING BACK RENEWABLES GROWTH

- The integration of additional renewables into the existing energy system is the main barrier to their large-scale deployment. While still in its infancy, battery storage is happening and set to play a key part in the future of the renewable energy industry, by enabling the storage of surplus energy that currently goes to waste.¹⁷
- Another key issue for further development is that the renewable energy market is fragmented, where renewable energy firms are small, local, and often lack the capital to grow – even if wind energy projects are growing in size. A more radical change will be needed to make the industry capable of competing on the scale necessary to displace fossil fuels.¹⁸
- The growth in renewables is not without challenges in other areas, in particular the agricultural sector, as competition for land use heats up, putting pressure on food prices. The transition also puts stress on cities traditionally built around fossil fuels – where infrastructure and urban planning systems are struggling to keep up.¹⁹

Renewables now cheaper than fossil fuel in Germany





Enostavne resnice

- Razogljičenje (dekarbonizacija) ≠ uvedba OVE
- Energetsko omrežje pridobiva nove funkcije:
 - Funkcija hranilnika
 - Informatizacija
 - Fleksibilnost
- Energetsko omrežje bo moralo zadržati nekatere funkcije:
 - Zanesljivost
 - Dostopnost
 - ...

Share of energy from renewable sources in the EU Member States

(2017, in % of gross final energy consumption)



Delež OVE v bruto končni porabi

$$DELEŽ\ OVE\ (%) = \frac{bruto\ končna\ poraba\ OVE}{bruto\ končna\ poraba\ VSE\ ENERGIJE}$$

Bruto končna poraba energije iz obnovljivih virov v vsaki DČ se izračuna kot vsota:

- (a) bruto končne porabe električne energije iz OVE;
- (b) bruto končne porabe energije iz OVE v sektorju ogrevanja in hlajenja ter
- (c) končne porabe energije iz OVE v prometnem sektorju.

Bruto končna poraba električne energije (EE) iz OVE se izračuna kot količina EE, **proizvedene** v državi članici iz OVE (vključno s samooskrbo).

Plin, električna energija in vodik iz OVE se za namene izračuna deleža bruto končne porabe energije upoštevajo samo enkrat.

Strateški dokumenti

- Nacionalni energetsko podnebni načrt (2030)
 - Dolgoročna strategija (MOP)
 - Energetski koncept Slovenije (2050/2060)
 - Akcijski načrt za skoraj nič energijske stavbe
 - Dolgoročna strategija energetske prenove stavb
-
- Operativni program Evropske kohezijske politike
2021 - 2027

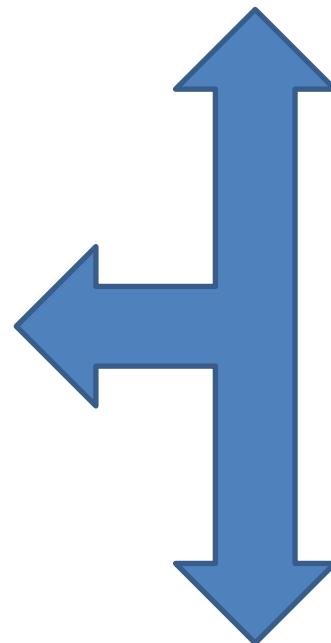


Namesto zaključka

Ključni izziv dekarbonizacije



Ključni izzivi - razvoj omrežij



Ključni izzivi – zanesljivost in konkurenčnost oskrbe

