

PERSPEKTIVE KONKURENTNOSTI TEČNOG PRIRODNOG GASA: OSVRT NA TRŽIŠTE EVROPSKE UNIJE

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Apstrakt

U radu ćemo istraživati razvoj i konkurentnost tržišta tečnog prirodnog gasa na području Evropske unije, naročito u njenim članicama koje se nalaze na zapadu i jugu Evrope. Polazimo od analize pravnog i regulatornog okvira na nivou Unije, u okviru kog funkcionišu terminali za tečni gas. Pored analize sadržaja, upoređićemo tendencije na evropskom tržištu tečnog gasa sa tendencijama u drugim regionima, pre svega na azijskom tržištu tečnog gasa. Rezultat istraživanja ukazuje na izmenjenu strukturu tržišta gasa u Uniji, koju karakteriše povećani uvoz tečnog gasa, naročito od kraja 2018. godine, kao i povećanje broja terminala i kapaciteta za prijem tečnog gasa. Ipak, rast udela tečnog gasa u ukupnom uvozu nije bio linearan prethodnih godina. U delu koji je posvećen diskusiji razmatramo tri moguća scenarija u pogledu budućnosti tečnog gasa na tržištu Evropske unije, i zaključujemo da će perspektiva tečnog gasa na tržištu zavisiti pre svega od cenovne konkurentnosti u odnosu na cevovodni način transporta gasa.

Ključne reči: *Tečni gas, LNG, tržište gasa u Evropskoj uniji, terminali za tečni gas*

JEL: *K23, K32, Q02, Q47*

Uvod

Energetsko tržište je poslednjih nekoliko decenija doživelo značajne promene, što se najbolje može uočiti na primeru energetskog tržišta Evropske unije. Institucije Unije su počele u većoj meri da se bave pitanjem energetskog tržišta i njegovim funkcionisanjem tek u poslednjoj deceniji XX veka. Jedan od predmeta interesovanja Evropske unije je bio i sektor gasa na energetskom tržištu. Evropa je tradicionalno bila tržište za prirodni gas koji se cevovodima

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dopremao iz susednih trećih zemalja. O tečnom prirodnom gasu (LNG - *liquefied natural gas*) se nije razmišljalo kao adekvatnoj alternativi, naročito kada tehnologija proizvodnje i prerade prirodnog gasa nije bila na visokom nivou, kada nije postojala značajna infrastruktura za prijem i regasifikaciju tečnog gasa, i kada tečni gas nije mogao cenovno da konkuriše gasu koji je stizao gasovodima.

Jedan od razloga zašto je došlo do povećanog interesovanja za razvoj infrastrukture za prijem tečnog prirodnog gasa u Evropi, bili su i prekidi tranzita gasa kroz teritoriju Ukrajine usled gasnog spora koji je nastao između ruskog Gasproma (*Gazprom*) i ukrajinskog Naftogasa (*Naftogaz*) 2006, odnosno 2009. godine (Obrenović, 2020). Tome treba dodati i spor između ruske i beloruske strane u pogledu prodajne cene gasa, pri čemu je Belorusija još jedna od tranzitnih država za ruski gas prema evropskim potrošačima. Pomenuti sporovi, naročito gasna kriza iz 2009. godine, zahtevali su adekvatan odgovor. Jedno od ključnih rešenja sadržano je u diverzifikaciji snabdevanja gasom. U tom kontekstu, deo odgovora na moguće krize u snabdevanju gasom u budućnosti, bilo je i povećanje uvoza tečnog prirodnog gasa iz različitih zemalja izvoznica tečnog gasa.

Nastavak rada će biti podeljen u četiri celine. Najpre ćemo izložiti rezultate istraživanja. Potom ćemo analizirati pravni i regulatorni aspekt funkcionisanja tržišta tečnog gasa, kao i postojeće kapacitete za prijem tečnog prirodnog gasa u Evropskoj uniji. Treći deo rada će se odnositi na analizu trenutnog stanja na tržištu tečnog gasa u Evropi, koje je godinama bilo u senci gasa koji se dopremao gasovodima iz susednih zemalja. Konačno, četvrti deo je posvećen perspektivi tečnog gasa u Evropskoj uniji i mogućim preprekama njegovoj daljoj ekspanziji. Na kraju su priložena zaključna razmatranja.

Rezultati istraživanja

Kada je reč o istraživanju konkurentnosti, odnosno perspektivi konkurentnosti tečnog prirodnog gasa na tržištu Evropske unije, potrebno je poći najpre od postojećeg regulatornog okvira koji se reflektuje na postojeće stanje na tržištu tečnog prirodnog gasa u Evropskoj uniji, i koji razlikuje ovo tržište od tržišta u drugim regionima. Kada je reč o analizi regulatornog okvira u okviru kog funkcioniše tržište tečnog gasa i perspektivama njegove konkurentnosti, postoji tek nekoliko studija na engleskom jeziku, dok na srpskom jeziku gotovo da nema radova koji se detaljnije bave ovim segmentom na tržištu gasa. Na engleskom jeziku autorka Jafimava (Katja Yafimava) se detaljnije bavila pravilima pristupa terminalima za tečni prirodni gas u Evropi i to u publikaciji Oksfordskog instituta za energetske studije (Yafimava, 2020).

Postoje studije u kojima se analizira razvoj infrastrukture i regulatorni okvir na tržištu tečnog prirodnog gasa u Evropi, ali koje su publikovane pre nekoliko godina i time ne obuhvataju značajne promene u pogledu regulatornog okvira i posledično izmenjenog stanja na tržištu (Dorigoni and Portatadino, 2008; Talus, 2009). Značajan broj radova je posvećen analizi bezbednosnog aspekta trgovine energentima, među kojima značajno mesto zauzima prirodni gas, odnosno tečni prirodni gas (Beriša i Rakić, 2016; Dašić, 2014). Kada je reč o trendovima u pogledu trgovine prirodnim gasom, Stanojević i Mišev u svom radu razmatraju i pitanje tržišta tečnog prirodnog gasa na globalnom planu (Stanojević i Mišev, 2018). Oni su predstavili postojeće kapacitete za tečni gas u Evropi, kao i one koje su planirani u budućnosti. Ipak, u njihovoj studiji nema detaljnije analize regulatornog okvira u okviru kog funkcioniše tržište tečnog prirodnog gasa. O značaju prirodnog gasa sa ekonomskog aspekta pisao je i autor Radiš, koji je analizirao trendove proizvodnje i potrošnje prirodnog gasa (Radiš, 2018). On se osvrnuo na celokupno tržište prirodnog gasa, uključujući tečni prirodni gas. U pomenutom radu se razmatra svetsko tržište prirodnog gasa, i predmet istraživanja nije ograničen isključivo na evropsko tržište.

Smatramo da je za razumevanje funkcionisanja tržišta gasa u Evropi neophodno analizirati postojeći regulatorni okvir jer su u njemu sadržana pravila koja regulišu poslovanje učesnika na tržištu i posledično utiču na dinamiku prekomorske trgovine gasom. Regulatorni režim u velikoj meri utiče i na konkurentnost tržišta tečnog prirodnog gasa jer određuje uslove pod kojima učesnici na tržištu mogu međusobno da se nadmeću. Ovaj rad treba da doprinese razumevanju postojećeg regulatornog okvira i stanja na tržištu tečnog prirodnog gasa u Evropskoj uniji, odnosno da ukaže na moguće pravce razvoja tržišta tečnog gasa u Evropi. Doprinos istraživanja se ogleda i u dopunjavanju postojeće naučne literature na srpskom jeziku koja za predmet ima analizu tržišta energenata, odnosno tržišta tečnog gasa.

Analiza regulatornog okvira i postojeći kapaciteti za prijem tečnog prirodnog gasa na tržištu Evropske unije

Kao što smo pomenuli u uvodnom delu rada, tržište gasa u Evropi se decenijama snabdevalo posredstvom gasovoda koji su dolazili (i dalje dolaze) iz trećih zemalja. Zapravo, transport gasa cevovodima ima dugu istoriju koja seže u period pre nove ere, kada su se cevi od bambusa koristile za provođenje prirodnog gasa u Kini (Hopkins, 2007). Razvojem ljudskog društva i tehnologije, gasovodi su građeni od znatno izdržljivijih materijala, što je omogućilo razvoj i umnožavanje cevovodne mreže za transport gasa.

Kada je reč o tečnom prirodnom gasu, eksperimentalni poduhvat transporta tečnog prirodnog gasa načinjen je 1958. godine, kada je prvi tanker za tečni gas Metan pionir (*Methane Pioneer*) polazeći od obale Sjedinjenih Država, preko Atlantskog okeana, pristao na obalu Kanvi ostrva (Canvey Island) u Ujedinjenom Kraljevstvu (Jensen, 2004). Nakon uspešnog eksperimenta, tečni prirodni gas prodire na tržište pojedinih zemalja koje su imale dovoljno finansijskih i tehničkih resursa za izgradnju postrojenja za prijem tečnog gasa. Prve komercijalne isporuke tečnog gasa za evropsko tržište, tačnije za tržište Ujedinjenog Kraljevstva i Francuske, započele su iz Alžira šezdesetih godina prošlog veka.

Druga polovina XX veka je bila obeležena postojanjem državnih monopola na energetsom tržištu. Države članice Evropske unije, u tom smislu, nisu bile izuzetak. Trend liberalizacije energetske tržišta je započeo najpre u Sjedinjenim Američkim Državama, potom i u Ujedinjenom Kraljevstvu. Nakon prvih rezultata liberalizacije energetske tržišta u ovim državama, bilo je jasno da se sa procesom liberalizacije može započeti i na nivou Unije. Proces liberalizacije je bio rukovođen željom da se omogući pristup što većem broju aktera energetsom tržištu, kako bi se pospešila konkurencija i međusobno takmičenje tržišnih učesnika. To je za krajnji cilj trebalo da doprinese boljoj usluzi krajnjim korisnicima, i većoj mogućnosti prilikom izbora usluge. Značajan korak je bilo uvođenje seta legislativnih instrumenata koji su postavili okvir za funkcionisanje tržišta električne energije i gasa, koji se kolokvijalno nazivaju energetske pakete (*energy package*).² Bitno je istaći da su se ovi pravni instrumenti od početka odnosili i na tržište tečnog prirodnog gasa.

Trenutno je na snazi treći energetske paket, koji je usvojen 2009. godine. Pored tržišta električne energije, ovim paketom su obuhvaćena i pravila koja se odnose na sektor gasa. Sastavni deo trećeg energetske paketa je i Direktiva 2009/73/EZ Evropskog parlamenta i Saveta iz 2009. godine, koja se tiče zajedničkih pravila u pogledu unutrašnjeg tržišta gasa. Ovim instrumentom su usvojene određene izmene u odnosu na prethodna dva energetske paketa, naročito uvođenjem koncepta vlasničkog razdvajanja (*ownership unbundling*). Pod vlasničkim razdvajanjem se podrazumeva da jedno preduzeće ne može da obavlja delatnosti transporta, odnosno distribucije, a da istovremeno bude vlasnik preduzeća koje obavlja delatnosti proizvodnje, odnosno snabdevanja

² Do sada su usvojena tri energetske paketa na nivou Evropske unije. Pod energetske paketima se podrazumeva set pravnih instrumenata (direktiva i uredbi) kojima se regulišu pitanja vezana za tržišta električne energije i gasa. Prvi energetske paket u sektoru gasa je usvojen 1998. godine. Drugi energetske paket je usvojen 2003. godine, dok je Treći energetske paket usvojen 2009. godine.

gasom (Art. 9 Directive 2009/73/EZ). Predviđena su i dva alternativna modela za slučaj da je transportni sistem u vlasništvu vertikalno integrisanog preduzeća na dan stupanja Direktive, to su modeli – nezavisnog operatora sistema (*ISO-Independent System Operator*) i nezavisnog operatora transportnog sistema (*ITO- Independent Transmission Operator*). Interesantno je da se obaveza razdvajanja iz Direktive ne odnosi i na operatore terminala za tečni prirodni gas, odnosno zahteva se samo zasebno vođenje računa (*account unbundling*) za svaku od delatnosti na tržištu gasa, ali ne i striktniji režim vlasničkog razdvajanja (Yafimava, 2020). To praktično znači da preduzeće može da obavlja delatnost operatora terminala tečnog prirodnog gasa, ali i da obavlja delatnosti proizvodnje i snabdevanja.

Pored odredbi o razdvajanju, veoma su značajne odredbe koje se odnose na pristup treće strane (*third party access*), odnosno regulisani pristup treće strane sistemu. Rešenje iz Prvog energetskeg paketa je dopuštalo pregovaranje (*negotiated*) ili regulisani (*regulated*) pristup, dok Drugi i Treći energetskegi paket uvode regulisani pristup kao obavezan na tržištu gasa. Pristup treće strane se zasniva na principima nediskriminacije i transparentnosti, odnosno na unapred objavljenim tarifama (i metodologiji na osnovu koje se određuju tarife). Pristup treće strane je detaljnije uređen Uredbom 715/2009 Evropskog parlamenta i Saveta iz 2009. godine, koja se odnosi na uslove pristupa mrežama za transport prirodnog gasa. Tehnički aspekti pristupa treće strane su sadržani u pravilima o mrežnim kodovima (*network codes*). Upravo su pravila o pristupu treće strane terminalima za tečni gas ono što razlikuje evropsko tržište u odnosu na tržišta u drugim regionima, pre svega u Aziji (kao glavnog tržišta za uvoz tečnog gasa).

U Evropskoj uniji, gotovo polovina članica poseduje ili velike terminale ili manje kapacitete za tečni prirodni gas. Te članice poseduju terminale za uvoz tečnog prirodnog gasa, odnosno terminale u kojima se vrši proces regasifikacije –prevođenje tečnog gasa u gasovito stanje, kako bi se dalje transportovao kroz sistem cevovoda. Treba napomenuti da i Turska, koja nije članica Unije, ali ima status kandidata za članstvo, takođe poseduje terminale za tečni prirodni gas. Prema podacima koji se odnose na period do kraja 2017. godine, u Evropi (uključujući i Tursku) bilo je 28 velikih terminala za uvoz tečnog gasa sa kapacitetom od 227 milijardi kubnih metara, koji mogu da zadovolje oko 40% evropskih potreba za gasom (King&Spalding, 2018). U tabeli ispod (Tabela 1) su obuhvaćeni samo terminali za prijem tečnog gasa velikog kapaciteta, dok su izostavljena manja postrojenja, poput onih u Danskoj, Švedskoj i Finskoj.

Tabela 1. Terminali velikog kapaciteta za uvoz tečnog gasa (LNG) u članicama Evropske unije

Terminali za tečni gas (LNG)	Država članica EU	Godišnji kapacitet (bcm)	Godina početka rada	Regulatorni režim
Barcelona	Španija	17.1	1968	Bez izuzeća
Cartagena	Španija	11.8	1989	Bez izuzeća
Huelva	Španija	11.8	1988	Bez izuzeća
Bilbao	Španija	8.8	2003	Bez izuzeća
Sagunto	Španija	8.7	2006	Bez izuzeća
El Musel*	Španija	6.9	2013 (izgrađen)	-
Mugaros	Španija	3.5	2007	Bez izuzeća
South Hook	UK	20.9	2009	Izuzeće
Grain	UK	19.5	2005	Izuzeće
Dragon	UK	7.6	1994	Izuzeće
Dunkerque	Francuska	13.1	2016	Izuzeće
Montoir	Francuska	10.1	1980	Bez izuzeća
Fos Cavaou	Francuska	8.3	2010	Bez izuzeća
Fos Tonkin	Francuska	3	1972	Bez izuzeća
Adriatic	Italija	7.6	2009	Izuzeće
Toscana(FSRU**)	Italija	3.8	2013	Bez izuzeća
Panigaglia	Italija	3.4	1971	Bez izuzeća
Gate	Holandija	12	2011	Izuzeće
Zeebrugge	Belgija	9	1987	Bez izuzeća
Sines	Portugal	7.6	2004	Bez izuzeća
Revithoussa	Grčka	6.9	2000	Bez izuzeća
Świnoujście	Poljska	5	2016	Bez izuzeća
Klaipėda (FSRU)	Litvanija	3.9	2014	Bez izuzeća
Delimara(FSU***)	Malta	0.7	2017	Bez izuzeća

Izvor: King&Spalding 2018;

Napomena: *Terminal El Musel u Španiji nije započeo sa radom usled odluke Vrhovnog suda Španije da prethodno dodeljena dozvola za izgradnju terminala nije bila usklađena sa važećim propisima (Enerdata, 2016); **FSRU– Floating Storage and Regasification Unit; ***FSU– Floating Storage Unit.

Bitno je istaći da postojeći prijemni terminali na teritoriji Evropske unije potpadaju pod režim Trećeg energetskeg paketa, kao što smo pomenuli u prethodnom delu rada. Ovaj pravno-regulatorni okvir je uveden sa ciljem da se postojeća energetska tržišta država članica što više integrišu, kako bi se razvilo unutrašnje tržište u sektoru gasa. Povezivanjem tržišta omogućava se povećano takmičenje među postojećim akterima, ali omogućava i pristup akterima koji nisu do sada bili prisutni na tržištu. Veći broj aktera doprinosi

umanjenju mogućnosti održavanja monopolskih struktura na tržištu. Ipak, Trećim energetske paketa je predviđena mogućnost zahtjevanja izuzeća od pojedinih odredbi energetske paketa, poput zahtjeva za razdvajanjem, pristupa treće strane ili obaveze objavljivanja tarifa i metodologije. Postupak izuzeća je bliže regulisan članom 36. Direktive 2009/73/EZ, u kojoj se, između ostalog, navodi da nova velika infrastruktura može da bude izuzeta u određenom vremenskom periodu od odgovarajućih odredbi ove Direktive, što se odnosi i na terminale za tečni gas (Art. 36. Directive 2009/73/EZ). Izuzeće može da se odobri ukoliko je ispunjeno pet uslova koji su navedeni u članu 36. Direktive.

Kada je reč o konkretnim terminalima za prijem tečnog prirodnog gasa u Evropskoj uniji, oni potpadaju pod različite regulatorne režime, u zavisnosti da li im je odobreno izuzeće u odnosu na pojedine odredbe Direktive 2009/73/EZ, na osnovu člana 36. Najveći broj postojećih terminala za tečni prirodni gas u Evropskoj uniji nije pod režimom izuzeća. Samo šest terminala potpada pod izuzeće, ali je njihov ukupni kapacitet oko 37% ukupnog uvoznog kapaciteta na nivou Unije (Yafimava, 2020; CEER Report 2019). Treba napomenuti da su izuzeti terminali dobili izuzeće na osnovu člana 22. Direktive 2003/55/EC, odnosno Drugog energetske paketa, a da je samo terminal Grain (Grain 4) u Ujedinjenom Kraljevstvu, dobio izuzeće na osnovu Direktive iz 2009. godine. Član 22. Direktive iz 2003. godine i član 36. Direktive iz 2009. godine, su gotovo identično formulisani. O dodeljivanju izuzeća odlučuju nacionalna regulatorna tela (NRA - *National Regulatory Authorities*), koja moraju da obaveste Evropsku komisiju o tome. Na osnovu teksta Direktive, Komisija može da zahteva od nacionalnog regulatornog tela da izmeni, dopuni ili povuče odluku kojom se dodeljuje izuzeće, ukoliko smatra da odluka ne ispunjava sve uslove. Do sada su svi zahtevi za izuzeće, kada je reč o terminalima za tečni prirodni gas, dobili potvrđan odgovor kako od strane nacionalnih regulatornih tela, tako i od Evropske komisije. Detalji o dodeljenom izuzeću su dostupni na internet stranicama regulatornih tela članica Unije, koja su donela odluku o izuzeću za pojedine terminale tečnog gasa na zahtev operatera terminala.

Za razliku od drugih delova sveta, pojedini energetske infrastrukturni projekti mogu da uživaju povoljniji položaj zahvaljujući pravno-regulatornom okviru unutar Evropske unije. Značajan korak je načinjen usvajanjem dve uredbe – Uredbe 347/2013 Evropskog parlamenta i Saveta iz 2013. godine, koja govori o smernicama za transevropsku energetske infrastrukturu, i Uredbe 1316/2013 Evropskog parlamenta i Saveta iz 2013. godine, o uspostavljanju Instrumenta za povezivanje Evrope. Ovi instrumenti treba da doprinesu stvaranju neophodne infrastrukture, kako bi se članice povezale i time stvorili uslovi za povećanu trgovinu i takmičenje aktera na unutrašnjem tržištu. Tome treba

dodati i razmatranje pitanja energetske bezbednosti, odnosno obezbeđivanje neprekidnog protoka energije i njenu dostupnost krajnjim korisnicima.

Uredba 347/2013 postavlja osnove za utvrđivanje projekata od opšteg, odnosno zajedničkog interesa (PCI - *Projects of Common Interests*). Odredbama Uredbe su bliže određene regionalne grupe koje okupljaju određeni broj članica, i koje treba da utvrde koji su to projekti od zajedničkog interesa (Art. 3. Regulation 347/2013). Nakon što regionalne grupe predlože listu projekata, Komisija na osnovu delegiranih ovlašćenja donosi popis onih projekata, koji su od zajedničkog interesa na nivou cele Evropske unije. Oni projekti koji se nalaze na listi projekata od zajedničkog interesa uživaju određene povoljnosti, kao što su efikasno i brzo izdavanje dozvola za projekat, odnosno podobnost projekata za finansijsku pomoć od strane Evropske unije (Chapter III and V Regulation 347/2013). Do sada je Komisija objavila četiri liste Projekata od zajedničkog interesa, pri čemu je poslednja lista objavljena krajem oktobra 2019. godine (ec.europa.eu, 2019). Ovde nećemo detaljnije analizirati sve projekte koji se nalaze na listi, već ćemo pomenuti projekte u oblasti tečnog prirodnog gas. Na četvrtoj listi Projekata od zajedničkog interesa u sektoru tečnog prirodnog gasa se nalaze predloženi terminali za tečni gas - terminal Šenon (Shannon LNG) u Irskoj, terminal Krk u Hrvatskoj, kao i terminali u severnoj Grčkoj, i terminal Gdanjsk (LNG Gdansk) u Poljskoj.

Kada je reč o Uredbi 1316/2013 kojom se uspostavlja Instrument za povezivanje Evrope (CEF - *Connecting Europe Facility*), radi se o instrumentu koji treba da unapredi finansiranje u tri ključna polja – telekomunikacijama, transportu i energetici (Art. 1. Regulation 1316/2013). Cilj jeste povezivanje članica i pomenuta tri polja kroz razvoj transevropskih mreža (*trans-European networks*). Kada je reč o sektoru energetike, ovim instrumentom je namenjeno preko 5 milijardi evra za period 2014-2020. Instrumentom je prepoznata potreba da se ostvare ciljevi energetske bezbednosti, održivog razvoja, prelaska na obnovljive izvore energije, smanjenje emisije štetnih materija, ali i podsticanje investicija u enrgetskom sektoru u slučaju kada tržište i postojeći regulatorni okvir ne mogu da obezbede neophodne investicije.

Analiza stanja tržišta tečnog prirodnog gasa u Evropskoj uniji i tendencije na svetskom tržištu

Evropsko tržište gasa je bilo prepoznatljivo po dominaciji sistema cevovoda, koji se protežu širom kontinenta. Uostalom, ovo je bila odlika i drugih tržišta širom sveta. Razvojem tehnologije, unapređivani su i sistemi gasovoda, ali je došlo i do komercijalizacije tečnog prirodnog gasa. Kao što smo pomenuli u početnom delu rada, pionirski poduhvat transporta tečnog gasa sa američke

obale prvim tankerom za tečni gas, stigao je do obale Ujedinjenog Kraljevstva. Nakon uspešnog poduhvata, transport tečnog gasa pomorskim putem je počeo da se intenzivira. Iako je došlo do uspostavljanja transporta tečnog prirodnog gasa iz Alžira za Francusku i Ujedinjeno Kraljevstvo, potom i iz Libije i drugih zemalja, cevovodni vid transporta gasa je i dalje dominirao u Evropi. Nisu samo ekonomski faktori uslovlili razvoj gasovodne mreže, nego i geografska pozicija evropskog kontinenta.

Među članicama Evropske unije retke su one koje imaju sopstvena nalazišta i rezerve gasa, koje mogu da podmire domaće potrebe. Neke od članica sa značajnom sopstvenom proizvodnjom gasa su Holandija i Ujedinjeno Kraljevstvo. Međutim, u poslednje vreme i ove države beleže pad proizvodnje od 14,5%, odnosno 3,2% (Eurostat 2019). Holandska vlada je najavila i etapno zatvaranje gasnog polja Groningen, najvećeg gasnog polja u Evropi (Dezem, 2019). Proizvodnja gasa u Evropskoj uniji nije dovoljna da zadovolji domaće potrebe, i iz tog razloga članice Unije se oslanjaju na uvoz gasa iz trećih zemalja. Među glavnim snabdevačima evropskih potrošača gasom putem gasovoda, izdvajaju se Rusija, Norveška, Alžir i Libija. Usled relativne geografske blizine evropskih potrošača, države izvoznici ovog energenta su iskoristili priliku da plasiraju gas izgradnjom većeg broja gasovoda. Vremenom se kao dodatni izvor snabdevanja javio tečni gas, zahvaljujući izgradnji terminala, odnosno postrojenja za uvoz tečnog prirodnog gasa.

Za razliku od geografskog položaja evropskih država, pojedine azijske zemlje nemaju pogodne uslove za dopremanje gasa putem gasovoda. Kada razmislimo o geografskom položaju Japana, Južne Koreje ili Tajvana, jasno je zašto u ovim državama tečni gas ima primat u odnosu na gas koji se doprema cevovodima. Pored ovih zemalja, proteklih godina i Kina je postala značajan uvoznik tečnog prirodnog gasa, te ovaj region predstavlja najznačajnije tržište za uvoz tečnog prirodnog gasa na globalnom nivou. Međutim, svetsko tržište tečnog gasa je podložno velikim promenama. Jedna od velikih promena je bila *energetska revolucija* u Sjedinjenim Američkim Državama, u kojima je došlo do porasta u proizvodnji gasa i nafte eksploatacijom škriljaca (Aguilera and Radetzki, 2014). Sve do energetske revolucije Sjedinjene Države su bile veliki uvoznik nafte i gasa, što se promenilo povećanjem domaće proizvodnje. Ovo je imalo velikog uticaja na svetskom tržištu energenata, jer su SAD postale značajan izvoznik. Ovo je uticalo i na druge države da razmotre mogućnost dobijanja energenata iz škriljaca, naročito u Kini, koja je postala i najveći uvoznik energenata (Clemente, 2019).

Kada je reč o uvozu tečnog prirodnog gasa u Evropu, možemo da primetimo značajne promene koje su se desile u proteklom periodu. Posmatrajući odnos

između gasa koje se doprema gasovodima i tečnog prirodnog gasa, potonji je imao udeo u uvozu od 14% tokom 2003. godine (Wood, 2016). Ovaj procenat je rastao u narednim godinama, ali rast udela tečnog gasa nije bio kontinuiran. Sve do nedavno, Azija je predstavljala dominantno tržište za izvoznike tečnog gasa. To je u velikoj meri bilo uslovljeno velikom potražnjom na ovom tržištu, ali i zahvaljujući višoj ceni po kojoj se tečni gas prodavao na azijskom u odnosu na druga tržišta. Na ovom tržištu izvoznici su ostvarivali tzv. azijsku premiju (*Asian premium*) odnosno višu prodajnu cenu, zahvaljujući povećanoj tražnji i nedostatku cevovodne infrastrukture za dopremanje gasa (Zhang, Shi and Shi, 2017). Međutim, kretanja cena na tržištu su uslovljena promenom ponude i tražnje za energentima. Kada je došlo do povećane ponude energenata na tržištu koja ni bila praćena povećanom tražnjom, to se odrazilo i na konačne cene energenata. Ova prezasićenost na tržištu tečnog gasa se javila krajem 2018. godine, što je naročito bila posledica slabijeg uvoza tečnog gasa na azijsko tržište, čime je gotovo i nestala premija koja je bila karakteristična za ovo tržište (Fulwood, 2019). To je doprinelo postepenom približavanju cena tečnog gasa na evropskom i istočno-azijskom tržištu.

Evropa je 2019. godine uvozila rekordne količine tečnog prirodnog gasa, i taj uvoz je dostigao blizu 76 miliona tona tečnog gasa, što je najveći uvoz do sada (Cox, 2020). Ovakav trend je pospešen povećanom proizvodnjom tečnog gasa, ali i manjom potražnjom na azijskom tržištu u odnosu na ukupnu ponudu. Pošto je azijsko tržište godinama unazad glavno tržište za uvoz tečnog gasa, povećana ponuda tečnog gasa je preusmerena na druga tržišta. Dobar deo ponuđenog tečnog gasa je završio na evropskom tržištu prethodne godine. Tako je Evropa uvezla oko 22% tečnog gasa koji je ponuđen 2019. godine na globalnom nivou, što je povećanje od 8% u odnosu na prethodnu godinu (Cox, 2020).

Tabela 2. Uvoz tečnog gasa po regionima u 2019. godini

Region	Evropa	Azija	Američki kontinent	Bliski Istok i Afrika
Uvoz LNG 2019.	22 %	59%	10%	9%

Izvor: Shell LNG Outlook 2019

Kada je reč o povećanju evropskog uvoza tečnog gasa (uključujući i Tursku pored članica Evropske unije), on je već premašio uvoz tečnog gasa u Japanu, sa 85 miliona tona naspram 76 miliona tona uvezenog tečnog gasa (Kravtsova, 2020). Japan je inače najveći pojedinačni uvoznik tečnog gasa, što je uslovljeno njegovom geografskom pozicijom, koja ne pogoduje razvoju cevovodnog sistema transporta gasa. Ova država je počela da uvozi više gasa

nakon nuklearne katastrofe u Fukušimi 2011. godine. Tada je bilo potrebno nadoknaditi električnu energiju koja se proizvodila zahvaljujući nuklearnoj energiji, i supstitut je pronađen u tečnom prirodnom gasu. Ipak, povećanjem broja ponuđača na svetskom tržištu tečnog gasa i povećanom proizvodnjom, došlo je do prezasićenosti azijskog tržišta tečnog gasa. Ovome treba pridodati i druge faktore, poput blagih zima proteklih godina, što je uslovalo manju potrošnju gasa.

Najveći izvoznici tečnog gasa su godinama u nazad bili Katar, Australija i Malezija. Među proizvođače tečnog gasa su se uključile i druge države. Sjedinjene Države su zahvaljujući proizvodnji gasa iz nekonvencionalnih izvora postale respektabilan akter na tržištu tečnog gasa. Američka agencija koja se bavi informacijama u oblasti energetike (EIA – Energy Information Administration), objavila je 2019. godine da su Sjedinjene Države dostigle treće mesto kada je reč o izvozu tečnog gasa, čime je prestigla Maleziju (eia.gov, 2019). Rusija se, takođe, uključila u proizvodnju i izvoz tečnog gasa, iako cevovodni transport gasa prema stranim potrošačima i dalje čini većinu njenog izvoza gasa. Katar, SAD i Rusija povećavaju svoj izvoz tečnog gasa u zemlje Evrope, dok su drugi značajni izvoznici još Alžir i Nigerija (Oil&Gas360, 2019).

Diskusija

U ovom delu rada razmotrićemo tri moguća scenarija u pogledu budućnosti tečnog gasa u članicama Unije. Prvi scenario podrazumeva održavanje *statusa quo* u sektoru tečnog prirodnog gasa, u Evropi. Drugi scenario podrazumeva ekspanziju ovog sektora, što će povećati uvoz tečnog prirodnog gasa u članice Unije i dovesti do ekspanzije kapaciteta i infrastrukture za prijem i regasifikaciju tečnog gasa. Prema trećem, sektor tečnog gasa može da bude suočen sa izazovima koji će dovesti do pada interesovanja za uvoz tečnog gasa, usled veće konkurentnosti gasa koji se doprema gasovodima ili drugih izvora energije (uglja, nafte, nuklearne energije, obnovljivih izvora energije), kao i mogućeg suočavanja sa procesom *dekarbonizacije* i ostvarivanjem visokih ekoloških standarda i ciljeva.

Prilikom razmatranja *statusa quo* u sektoru tečnog gasa, razlikujemo dve situacije. Prva se odnosi na *status quo* u pogledu postojećih kapaciteta i infrastrukture za prijem i regasifikaciju tečnog gasa. Ovo podrazumeva da neće biti značajnijih ulaganja u nova kapacitete za uvoz tečnog gasa, ili da neće doći do povećanja kapaciteta postojećih terminala i postrojenja za tečni gas. Ovakav scenario može da se opravda činjenicom da je iskorišćenost postojeće infrastrukture za tečni gas prethodnih godina bila na niskom nivou. Procenat iskorišćenosti kapaciteta za tečni gas je varirao proteklih godina, tako da je od 50% iskorišćenosti 2010. godine,

počeo da opada narednih godina na nivo između 20, 25% iskorišćenosti (Zaretskaya and Kim, 2018). Ovde treba uzeti u obzir i izgradnju novih postrojenja, kao i ekspanziju već postojećih, koji su delimično doprineli ovakvoj statistici. Nivo iskorišćenosti kapaciteta za tečni gas, naravno, varira od zemlje do zemlje i od potreba domaćeg tržišta tokom sezone. Prethodna, 2019. godina, bila je rekordna po pitanju iskorišćenosti terminala za tečni gas na nivou Unije, i iznosila je do septembra 2019. blizu 50%, za razliku od 2018. godine kada je prosek bio oko 26% (Market Observatory for Energy, 2019). Veća iskorišćenost terminala za uvoz tečnog gasa se objašnjava povećanom konkurencijom i ponudom na tržištu tečnog gasa, kao i manjom tražnjom na azijskom tržištu koje je i vodeće tržište za uvoz tečnog gasa.

Druga aspekt *statusa quo* u sektoru tečnog gasa se odnosi na održavanje postojećeg nivoa uvoza tečnog gasa, čak i u slučaju izgradnje novih ili proširenja postojećih terminala i kapaciteta za prijem tečnog gasa. To je usko povezano sa prethodnim što smo rekli, u pogledu iskorišćenosti kapaciteta za prijem i regasifikaciju tečnog gasa u Evropskoj uniji. Izgradnja novih postrojenja za tečni gas ne mora nužno da dovede do povećanog uvoza tečnog gasa. Postoji veliki broj razloga zašto se ne postiže veća iskorišćenost kapaciteta, poput većeg uvoza gasa koji se doprema gasovodima ili korišćenja konkurentnih izvora energije, ili pak perioda smanjene potražnje za svim izvorima energije. Čini se da je 2019. godina dovela do prekida *statusa quo* kada je reč o uvozu tečnog gasa, jer je došlo do značajnog povećanja uvoza usled povećane ponude tečnog gasa na svetskom tržištu. Za razliku od tržišta pojedinih azijskih zemalja, poput Japana ili Koreje, na evropskom tržištu gasa, tečni gas će i dalje imati konkurenciju od gasa koji se doprema gasovodima iz trećih zemalja.

Prema drugom mogućem scenariju, dolazi do ekspanzije u sektoru tečnog gasa, kako u pogledu izgradnje novih kapaciteta ili proširenja postojećih, tako i u pogledu uvoza tečnog gasa na evropsko tržište. Ovaj scenario se uklapa u okvire budućih planova pojedinih članica Unije, koje nameravaju da prošire postojeće kapacitete ili da izgrade nova postrojenja za uvoz tečnog gasa. U prethodnom delu rada smo naveli i da se određeni broj planiranih projekata sa liste projekata od zajedničkog interesa, odnosi i na sektor tečnog gasa. Iako je izgrađen veliki broj terminala za prijem tečnog gasa prethodnih godina, većina njih je smeštena u jugo-zapadnoj i zapadnoj Evropi. Investicije koje se odnose na infrastrukturu u sektoru tečnog gasa u velikoj meri zavise i od kretanja cena gasa na tržištu, na čemu se zasniva i njihova profitabilnost. Ipak, pored ekonomske računice, značajna pažnja je posvećena i bezbednosnom aspektu, odnosno sigurnosti snabdevanja. Mnoge države se priklanjaju projektima u sektoru tečnog gasa, kako bi prevazišle moguće probleme u pogledu neprekidnog snabdevanja, imajući u vidu krize vezane za tranzit gasa kroz gasovod. Ekspanzija kapaciteta u sektoru tečnog gasa je vrlo verovatna

ukoliko dođe do povećanog uvoza i tražnje za tečnim gasom u Uniji. Primer iz 2019. godine, kada je postignut rekordan uvoz tečnog gasa u članice Evropske unije, ne znači nužno da će se taj trend održati i u budućnosti. Članice Unije mogu da se okrenu tečnom gasu u slučaju povećane ponude na svetskom tržištu tečnog gasa, koja doprinosi većoj konkurenciji i snižavanju cena. Prednost evropskog tržišta tečnog gasa je u postojećem pravnom i regulatornom okviru, koji omogućava pristup treće strane terminalima i objavljivanje tarifa i metodologije (koji se ne odnosi u slučaju režima izuzeća). To je omogućilo da evropsko tržište primi tečni gas kada izvoznici gasa nisu mogli da nađu mesto na azijskom tržištu.

Konačno, treći scenario podrazumeva regresivne tendencije u sektoru tečnog gasa. Jedan od razloga koji može da doprinese opadanju ovog sektora jeste visoka cena tečnog gasa na tržištu u odnosu na druge, konkurentne izvore energije. Najpre, tečnom gasu konkuriše prirodni gas koji se doprema gasovodima. Iako je godinama unazad tečni gas generalno bio skuplji u odnosu na gas iz cevovoda, ovo ne mora više da bude slučaj. Zahvaljujući napretku tehnologije i izgradnji velikog broja kapaciteta za tečni gas, ali i ulasku sve većeg broja ponuđača na tržište, došlo je do značajnog smanjenja cena ovog gasa. Cenu gasa u velikoj meri određuje i distanca od izvoznih terminala do terminala za uvoz tečnog gasa, odnosno troškovi transporta. Tečnom gasu mogu da konkurišu i drugi izvori energije, poput uglja, nuklearne energije ili obnovljivih izvora energije. Naročito je značajno pitanje prelaska na čiste, odnosno obnovljive izvore energije, pri čemu se postavlja pitanje da li upotrebu fosilnih goriva treba redukovati na najniži nivo ili u potpunosti izbaciti kao izvor energije. Prirodni gas mnogi posmatraju kao tranzicioni, odnosno prelazni izvor energije, do potpunog prelaska na obnovljive izvore energije. Međutim, nije mali broj zagovornika koji se zalažu za prestanak upotrebe prirodnog gasa (uprkos manjoj emisiji u odnosu na uglj i naftu) u sklopu strategije prelaska na obnovljive izvore. To bi u krajnjem pogodilo i sektor tečnog prirodnog gasa, što bi doprinelo opštem padu i regresivnim tendencijama u ovom sektoru.

Zaključak

Kada je reč o konkurentnosti, odnosno perspektivi konkurentnosti tržišta tečnog prirodnog gasa u Evropskoj uniji, važno je poći od postojećeg regulatornog okvira bez koga se ne mogu razumeti tendencije i trenutno stanje na tržištu prirodnog gasa i po čemu se tržište tečnog gasa u Evropi razlikuje od tržišta tečnog gasa u drugim regionima sveta. Od početka procesa liberalizacije tržišta prirodnog gasa, i sektor tečnog prirodnog gasa je bio predmet novih propisa koji su usvojeni na evropskom nivou. Danas je ovaj sektor regulisan propisima Trećeg energetskeg paketa, kao i brojnim pravnim aktima koji za predmet imaju uređenje odnosa na tržištu prirodnog gasa.

Evropsko tržište je tradicionalno uvozilo prirodni gas sistemom cevovoda iz većeg broja zemalja u okruženju. Tržište tečnog prirodnog gasa u Evropskoj uniji doživljava ekspanziju poslednjih nekoliko godina zahvaljujući razvoju kapaciteta i postrojenja za prijem i regasifikaciju tečnog prirodnog gasa. U radu smo tabelarno predstavili terminale velikog kapaciteta za uvoz tečnog prirodnog gasa, koji su uglavnom locirani u jugo-zapadnoj i zapadnoj Evropi. Takođe, pored postojećih kapaciteta u planu je izgradnja novih kapaciteta, od kojih se jedan broj našao na listi projekata od zajedničkog interesa EU, što sa sobom nosi i određene pogodnosti u samoj pripremi i realizaciji projekta.

Postojanje značajnog kapaciteta za prijem tečnog gasa i planovi za dalju ekspanziju kapaciteta ne znače istovremeno i veću trgovinu tečnim gasom, odnosno njihovu punu iskorišćenost. U delu rada koji je posvećen diskusiji smo predstavili moguće scenarije kada je reč o konkurentnosti tečnog prirodnog gasa na tržištu Evropske unije. Iako je 2019. godine zabeležen značajan uvoz tečnog prirodnog gasa u Evropu u poređenju sa prethodnim godinama, smatramo da ovaj trend ne mora nužno da bude linearan u budućnosti. Trenutno stanje na tržištu gasa u Evropi ukazuje da će cevovodni vid transporta i dalje biti više zastupljen u odnosu na uvoz tečnog prirodnog gasa, kao i da je ovakav trend u velikoj meri uslovljen cenovnom konkurentnošću gasa koji se doprema gasovodima. U prilog tome govori i veći broj projekata novih gasovoda u Evropi, koji se realizuju uporedo sa projektima u oblasti tečnog gasa, što znači da evropske zemlje nisu odustale od ovakvog način dopremanja prirodnog gasa.

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PERSPECTIVES ON LNG COMPETITIVENESS: AN OVERVIEW OF THE EU MARKET

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Review article

Summary

In this paper we research the development and competitiveness of the LNG (Liquefied Natural Gas) market in the European Union, especially in its member states located in west and south of Europe. First, we analyze legal and regulatory framework at the EU level, under which LNG terminals and facilities operate. In addition to content analysis, we also compare trends in the European LNG market with trends in other regions, especially in the Asian LNG market. The result of the research highlights the changed structure of the EU's gas market, characterized by larger imports of liquefied natural gas, especially since the end of 2018, as well as increased number of terminals and capacities for receiving liquefied gas. However, the growth in the share of liquefied gas in total import was not linear in the previous years. As a part of the discussion we examine three possible scenarios regarding the future of LNG market in the European Union, and we conclude that the perspective of LNG in the market will primarily depend on price competitiveness comparing it to pipeline gas transport.

Key words: *Liquefied natural gas, LNG, EU gas market, LNG Terminals*

Introduction

The energy market has undergone significant changes in the last few decades, which can best be seen in the example of the EU energy market. EU's institutions began dealing more with the issue of the energy market and its functioning in the last decade of the 20th century. One of the subjects of interest of the EU was the natural gas sector in the energy market. Europe was traditionally the market for natural gas that uses pipelines to supply it from neighbouring third countries. Liquefied natural gas (LNG) wasn't considered as an alternate alternative, especially when the technology for producing and processing natural gas wasn't at a high level, when there was no significant infrastructure for receiving and regasifying liquid gas and when liquid gas couldn't compete in price with gas that arrived through pipelines.

One of the reasons why there was increased interest for developing an infrastructure for receiving LNG in Europe was the interruption of gas transit through the territory

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of Ukraine due to a dispute that occurred between Russian Gazprom and Ukrainian Naftogaz in 2006 and again in 2009 (Obrenović, 2020). It should be noted that there was a dispute between Russia and Belarus regarding the selling price of gas, where Belarus was another transit country for Russian gas to European consumers. Noted disputes, especially the gas crisis of 2009 demanded an adequate answer. One of the key solutions was in diversifying the gas supply. In that context, part of the answer for the possible crisis in supplying gas in the future was increasing import of LNG from different exporting countries.

The paper will be divided into four sections. We will first present the results of the research. Then we will analyze the legal and regulatory aspect of the liquid gas market functioning, as well as the existing capacities for accepting LNG in the EU. Third part of the paper will be related to analyzing the current state of the liquid gas market in Europe, which has been in the shadow of gas delivered from neighbouring countries for years. Finally, the fourth part is regarding the perspective of liquid gas in the EU and possible obstacles in its further expansion. Finally, concluding remarks were attached.

Research results

When we talk about researching competitiveness, i.e. the perspective of competitiveness of LNG on the EU market, it's necessary to firstly start from the existing regulatory framework that reflects the current state on the LNG market in the EU, which differentiates this market from markets in other regions. When it comes to analyzing the regulatory framework within which the liquid gas market functions and the perspectives of its competitiveness, there are only a few studies in English, while there are almost no papers in Serbian that deal in more detail with this segment of the gas market. In English, the author Katja Yafimava dealt in more detail with the rules of accessing LNG terminals in Europe in a publication of the Oxford Institute for Energy Studies (Yafimava, 2020). There are studies that analyze the development of infrastructure and regulatory framework on the LNG market in Europe, but those are published several years ago and don't encompass significant change in the regulatory framework and consequent altered state on the market (Dorigoni, Portatadino, 2008; Talus, 2009). Significant number of papers are dedicated to analyzing the security aspect of energy trade, among which natural gas i.e. LNG occupies a significant place (Beriša, Rakić, 2016; Dašić, 2014). When it comes to trends in natural gas trade, Stanojević and Mišev also consider in their paper the LNG market on a global level (Stanojević, Mišev, 2018). They presented the existing capacities for liquid gas in Europe, as well as those planned in the future. However, their study doesn't have a more detailed analysis of the regulatory framework within which the LNG market functions. The author Radiš also wrote on the significance of natural gas

from an economic aspect, analyzing the trends of producing and consuming natural gas (Radiš, 2018). He looked at the entire natural gas market, including LNG. He considers the world market of natural gas in the mentioned paper, and the research subject isn't exclusively limited to the European market.

We believe that in order to understand the functioning of natural gas in Europe it's necessary to first analyze the existing regulatory framework, because it contains the rules that regulate doing business for participants on the market and consequently influence the dynamics of overseas gas trade. The regulatory regime also greatly affects the competitiveness of the LNG market because it determines the conditions under which market participants can compete with each other. This paper should contribute to understanding the existing regulatory framework and the state on the LNG market in the EU, i.e. to indicate possible directions for development of the liquid gas market in Europe. The contribution of the research is reflected in supplementing the existing scientific literature in Serbian and English, which has in its subject the analysis of the energy market, i.e. liquid gas market.

Analysis of the regulatory framework and existing capacities for accepting liquified natural gas on the EU market

As we mentioned in the introduction, the gas market in Europe has been supplied for decades by pipelines that came from (and are still coming from) third countries. In fact, transporting gas through pipelines has a long history dating back to before the new era, when bamboo pipes were used to conduct natural gas in China (Hopkins, 2007). With the development of human society and technology, gaslines were built from much more durable materials, which enabled development and multiplication of the pipeline network for gas transport.

When it comes to LNG, and experimental venture was taken in 1958 to transport LNG, when the first liquified gas tanker *Methane Pioneer* landed of the coast of the United States, across the Atlantic, on the coast of Canvey Island in the United Kingdom (Jensen, 2004). After a successful experiment, LNG penetrated the markets of certain countries that had sufficient financial and technical resources to build facilities for receiving liquified gas. First commercial deliveries of liquified gas for the European market, more precisely United Kingdom and France started from Algeria in the 1960s.

Second half of the 20th century was marked with the existence of state monopolies on the energy market. Member states of the EU were no exception in that sense. The trend of energy market liberalization first began in the United States of America, then in the United Kingdom. After the initial results of liberalizing the energy market in these countries, it was evident that the liberalization process can begin at the Union level as well. The liberalization process was driven by the desire

to enable access to as many participants as possible on the energy market in order to foster competition between market participants. This had an ultimate goal to contribute to better service of end user and greater opportunity when choosing a service. A significant step was introducing a set of legislative instruments that set the framework for the functioning of the electricity and gas markets, colloquially referred to as energy packages.⁴ It's necessary to point out that these legal instruments have referred to the LNG market from the beginning.

Currently, the third energy package is in effect, adopted in 2009. In addition to the electricity market, this package also included rules related to the gas sector. Directive 2009/73/EZ of the European parliament and Council from 2009 is an integral part of the third energy package, concerning common rules regarding the internal gas market. This instrument was used to adopt certain changes in relation to the previous two energy packages, especially by introducing the ownership unbundling concept. Ownership unbundling means that one company cannot perform transmission and distribution activities, and at the same time be the owner of a company that performs production, i.e. gas supply activities (Directive 2009/73/EZ Art. 9). Two alternative models are envisaged in case the transport system is owned by a vertically integrated company on the day the Directive came into force, which are Independent System Operator (ISO) and Independent Transmission Operator (ITO). Interestingly, the unbundling obligation from the Directive doesn't apply to LNG terminal operators, i.e. only account unbundling is required for each activity on the gas market, but not a stricter ownership unbundling regime (Yafimava, 2020). It practically means that a company can perform the activities of LNG terminal operators, but also perform the activities of production and supply.

In addition to the provisions on unbundling, there are very significant provisions related to third party access, i.e. regulated third party access to the system. Solution from the First energy package allowed a negotiated or regulated approach, while the Second and Third energy packages introduced regulated approach as mandatory on the gas market. Third party approach is based on principles of non-discrimination and transparency, i.e. on pre-announced tariffs (and the methodology on the basis of which tariffs are determined). Third party access is regulated in more detail by Regulation 715/2009 of the European Parliament and Council from 2009, which refers to the conditions of access to natural gas transmission networks. Technical aspects of third party approach are contained in the network codes rules. It's

⁴ So far, three energy packages have been adopted at the EU level. Energy packages mean a set of legal instruments (directives and regulations) that regulate issues related to the electricity and gas markets. First energy package in the gas sector was introduced in 1998. Second energy package was introduced in 2003, while the Third energy package was introduced in 2009.

precisely those rules on third party access to liquified gas terminals that differentiate the European market from markets in other regions, primarily Asia (as the main market for liquified gas import).

Almost half of the members of the European Union have either large terminals or smaller LNG capacities. Those members own terminals for importing LNG, i.e. terminals in which the regasification process is performed – converting liquified gas into gaseous state, in order to transport it further through the pipeline system. It should be noted that Turkey, which is not a member of the Union, but has the status of a candidate for membership, also has terminals for LNG. According to data related to the period up to the end of 2017, there were 28 large terminals in Europe (including Turkey) for importing LNG with a capacity of 227 billion cubic meters, which can meet about 40% of European gas needs (King, Spalding, 2018). The table (Table 1) includes only high-capacity terminals for importing liquified gas, while smaller plants, such as those in Denmark, Sweden and Finland are omitted.

Table 1. High-capacity terminals for importing LNG in EU member states

Terminals for liquified natural gas (LNG)	EU member state	Yearly capacity (bcm)	Year it started working	Regulatory regime
Barcelona	Spain	17.1	1968	Without exception
Cartagena	Spain	11.8	1989	Without exception
Huelva	Spain	11.8	1988	Without exception
Bilbao	Spain	8.8	2003	Without exception
Sagunto	Spain	8.7	2006	Without exception
El Musel*	Spain	6.9	2013 (built)	-
Mugarodos	Spain	3.5	2007	Without exception
South Hook	UK	20.9	2009	Exception
Grain	UK	19.5	2005	Exception
Dragon	UK	7.6	1994	Exception
Dunkerque	France	13.1	2016	Exception
Montoir	France	10.1	1980	Without exception
Fos Cavaou	France	8.3	2010	Without exception
Fos Tonkin	France	3	1972	Without exception
Adriatic	Italy	7.6	2009	Exception
Toscana(FSRU**)	Italy	3.8	2013	Without exception
Panigaglia	Italy	3.4	1971	Without exception
Gate	Netherlands	12	2011	Exception
Zeebrugge	Belgium	9	1987	Without exception
Sines	Portugal	7.6	2004	Without exception
Revithoussa	Greece	6.9	2000	Without exception
Swinoujście	Poland	5	2016	Without exception
Klaipėda (FSRU)	Lithuania	3.9	2014	Without exception
Delimara(FSU***)	Malta	0.7	2017	Without exception

Source: King, Spalding 2018;

Note: * El Musel Terminal in Spain hasn't started working due to the decision of the Supreme Court of Spain that the previously granted permit for construction of the terminal was not in compliance with applicable regulations (Enerdata, 2016); **FSRU– Floating Storage and Regasification Unit; ***FSU-Floating Storage Unit.

It's important to point out that existing receiving terminals in the European Union fall under the regime of the Third energy package, as mentioned in the previous part of the paper.

This legal-regulatory framework was introduced with the aim of integrating the existing energy markets of the member states as much as possible, in order to develop the internal market in the gas sector. Linking the markets allows increased competition among existing participants, but also allows access to those who weren't present on the market. Larger number of participants contributes to reduction of the possibility of maintaining monopoly structures on the market. However, the Third energy package included the possibility of requesting exemptions from certain provisions of the energy package, such as unbundling requirements, third party access or the obligation to publish tariffs and methodology. The exemption procedure is further regulated by article 36 of the Directive 2009/73/EZ, which states, inter alia, that a new large infrastructure must be exempted in a certain time period from certain provisions of this Directive, which also relates to liquified gas terminals (Art. 36. Directive 2009/73/EZ). An exemption may be granted if the five conditions set out in Article 36 of the Directive are met.

Specific LNG terminals in the EU fall under different regulatory regimes, depending on whether they have been granted an exemption from certain provisions of Directive 2009/73/EZ, based on Article 36. Most of the existing LNG terminals in the European Union are not exempted. Only six terminals are exempted, but their total capacity is around 37% of total import capacity at Union level (Yafimava, 2020; CEER Report 2019). It should be noted that exempted terminals received an exemption based on Article 22 of Directive 2003/55/EC, i.e. Second energy package, and that only the Grain terminal (Grain 4) in the United Kingdom received an exemption under the 2009 Directive. Article 22 from the 2003 Directive and Article 36 from the 2009 Directive are almost identically formulated. National Regulatory Authorities (NRA) decide on granting exceptions and they must notify the European Commission on their decision. Based on the text from the Directive, the Commission can request from the national regulatory body to amend, supplement or withdraw the decision on granting an exemption if it considers that the decision does not meet all conditions. So far all requests for exemption, when it comes to LNG terminals, received an affirmative answer from both national regulatory bodies and the European Commission. Details on a granted exemption are available on the websites of regulatory bodies of Union member states that made the decision on exemption for certain liquified gas terminals at the request of the terminal operator.

Unlike other parts of the world, certain energy infrastructure projects can enjoy a more favorable position thanks to the legal and regulatory framework within the European Union. A significant step was taken with the adoption of two regulations – Regulation 347/2013 of the European Parliament and the Council from 2013, which deals with guidelines for trans-European energy infrastructure and Regulation 1316/2013 of the European Parliament and the Council from 2013 on establishing the Instruments for connecting Europe. These instruments should contribute to creating the necessary infrastructure, in order for member states to connect and thus create conditions for increased trade and competition of participants in the internal market. Energy security issues should be added to this, i.e. ensuring the uninterrupted flow of energy and its availability to end users.

Regulation 347/2013 lays the foundation for identifying Projects of Common Interest (PCI). Provisions of the Regulation specify in more detail certain regional groups that gather certain members, which should determine which projects are of common interest (Art. 3. Regulation 347/2013). After regional groups propose a list of projects, the Commission adopts a list of those projects that are of common interest at the EU level based on delegated powers. Projects that are on the list of projects of common interest enjoy certain benefits, such as efficient and fast issuance of project permits, i.e., the eligibility of projects for financial support by the European Union (Chapter III and V Regulation 347/2013). The Commission published four lists of Projects of common interest so far, the last of which was published at the end of October 2019 (ec.europa.eu, 2019). We will not analyze all projects on the list in more detail, but only mention projects in the LNG field. The fourth list of PCIs in the LNG sector are the proposed liquified gas terminals – Shannon LNG in Ireland, Krk terminal in Croatia, as well as terminals in north Greece and Gdanjsk LNG terminal in Poland.

When it comes to Regulation 1316/2013 that establishes the Instrument for Connecting Europe Facility (CEF), it's an instrument that should improve funding in three key areas – telecommunications, transmission and energy (Art. 1. Regulation 1316/2013). The goal is to connect the members and the mentioned three fields through the development of trans-European networks. When it comes to the energy sector, through this instrument, over 5 billion euros were allocated in the time period from 2014 to 2020. Through the instrument, a need was recognized to achieve goals of energy security, sustainable development, transition to renewable energy sources, reducing emissions, but also encouraging investment in the energy sector in cases when the market and the existing regulatory framework can't provide the necessary investment.

Analysis of the state of the LNG market in the European Union and tendencies on the world market

European gas market was recognizable by the dominance of pipeline systems, which stretch across continents. After all, this was a characteristic of other markets around the world. With development of technology, gas pipeline systems were also improved, but it results in commercialization of LNG. As we mentioned in the initial part of the paper, the pioneering endeavor of transporting liquified gas from the American coast by the first liquified gas tanker to the coast of the United Kingdom. After a successful venture, transport of liquified gas by sea began to intensify. Although the transport of LNG was established from Algeria to France and United Kingdom, and then from Libya and other countries, the pipeline mode of gas transport still dominated in Europe. Economic factors aren't the only ones that conditioned the development of gas networks, but also the geographical position of the European continent.

Among member states of the European Union, there are few who have their own fields and gas reserves that can meet domestic needs. Some of the members that have a significant gas production are Netherlands and United Kingdom. However, these countries have recorded a decline in production by 14.5% (Netherlands) and 3.2% (UK) (Eurostat, 2019). The Dutch government also announced the phased closure Groningen gas field, the largest gas field in Europe (Dezem, 2019). Gas production in the European Union isn't sufficient to meet domestic needs, and for that reason the members of the Union rely on import of gas from third countries. Russia, Norway, Algeria and Libya stand out among the main suppliers of gas to European consumers through the gas pipeline. Due to the relative geographical proximity of European consumers, countries exporting this energy source used this opportunity to sell gas by building a larger number of gas pipelines. Over time, liquified gas appeared as an additional source of supply, thanks to the construction of terminals, i.e., plants for importing LNG.

Unlike the geographical position of European countries, certain Asian countries do not have favorable conditions for supplying gas through pipelines. When we consider the geographical position of Japan, South Korea or Taiwan, it's clear why liquified gas has priority in these countries over gas that is delivered by pipelines. In addition to these countries, China became a significant importer of LNG in recent years, so this region is the most important market for importing LNG globally. However, the world liquified gas market is susceptible to large changes. One of the great changes was the energy revolution in the USA, where there was an increase in production of

gas and oil by shale exploitation (Aguilera, Radetzki, 2014). Until the energy revolution, the United States were a major importer of gas and oil, which changed with increased domestic production. This had great importance on the world energy market, as the USA became a significant exporter. This influenced other countries to consider the possibility of obtaining energy from shales, especially in China, which became the largest importer of energy sources (Clemente, 2019). When it comes to importing LNG in Europe, we can notice significant changes that took place in the past. Observing the relationship between gas supplied by pipelines and LNG, the latter had 14% share in imports in 2003 (Wood, 2016). This percentage grew in the following years, but the growth in share of liquified gas was not continuous. Until recently, Asia was the dominant market for exporters of liquified gas. This was largely due to high demand in this market, as well as higher price of liquified gas in the Asian market compared to other markets. In this market, exporters have achieved the so-called Asian premium, i.e. higher selling price, due to increased demand and lack of pipeline infrastructure for gas supply (Zhang, Shi and Shi, 2017). However, market price movements are conditioned by changes in supply and demand for energy sources. When there was an increased supply of energy sources on the market, which wasn't accompanied by increased demand, it reflected on the final prices. This oversaturation on the liquified gas market occurred at the end of 2018, which was especially a consequence of weaker imports on the Asian market, which nearly removed the premium that was characteristic for this market (Fulwood, 2019). It contributed to a gradual convergence of liquified gas prices on the European and East Asian market.

Europe reported a record in importing LNG in 2019, reaching nearly 76 million tons of liquified gas, which is the largest import so far (Cox, 2020). This trend is accelerated by increased production of liquified gas, but also lower demand on the Asian market compared to the total supply. Since the Asian market is the main importing market of liquified gas for years, increased production of liquified gas is redirected to other markets. A big part of offered liquified gas ended up on the European market last year. Thus, Europe imported about 22% of LNG offered in 2019 globally, an 8% increase over the previous year (Cox, 2020).

Table 2. Liquified gas import by regions in 2019

Region	Europe	Asia	American continent	Middle East and Africa
Import of LNG in 2019.	22 %	59%	10%	9%

Source: Shell LNG Outlook 2019

When it comes to increasing European imports of liquified gas (including Turkey), it surpassed the import of liquified gas in Japan, with 85 million tons compared to 76 million tons of imported liquified gas (Kravtsova, 2020). Japan is the single largest importer of liquified gas due to its geographical position, which does not favor the development of the gas pipeline transportation system. This country began importing more gas after the 2011 Fukushima nuclear disaster. It was necessary to compensate for the electricity produced by nuclear energy, and a substitute was found in LNG. However, with an increase in the number of producers on the world liquified gas market and increased production, the Asian market was oversaturated. Mild winters in previous years have contributed to lower gas consumption.

Largest exporters of liquified gas in previous years were Qatar, Australia and Malaysia. Other countries joined LNG producers. Thanks to gas production from unconventional sources, the United States became a respectable player on the liquified gas market. The US Energy Information Administration (EIA) announced in 2019 that the United States have reached third place when it came to liquified gas exports, surpassing Malaysia (eia.gov, 2019). Russia also became involved in producing and exporting liquified gas, even though pipeline transport of gas to foreign countries still accounts for the majority of gas exports. Qatar, USA and Russia are increasing exports of LNG to European countries, while other significant exporters are Algeria and Nigeria (Oil&Gas360, 2019).

Discussion

In this part of the paper, we will consider three possible scenarios regarding the future of liquified gas in Union members. The first scenario involves maintaining the status quo in the LNG sector in Europe. The second scenario implies the expansion of this sector, which will increase the import of LNG to the members of the Union and lead to the expansion of capacity and infrastructure for the reception regassification of LNG. According to the third, LNG sector may face challenges that will lead to a decline in interest for LNG imports, due to greater competitiveness of gas supplied by pipelines or other energy sources (coal, oil, nuclear energy, renewable energy sources), as well as possible coping with the decarbonization process and achieving high environmental standards and goals.

When considering the status quo in the LNG sector, we differentiate two situations. The first relates to the status quo in terms of existing capacities and infrastructure for receiving and regasifying liquified gas. This means that there will be no significant investments in new liquified gas import capacities, or

that there will be no increase in capacity of existing LNG terminals and plants. This scenario can be justified by the fact that the utilization of existing liquified gas infrastructure in previous years was low. Percentage of capacity utilization for LNG varied in recent years, so it began to fall from 50% in 2010 to 20-25% utilization in the following years (Zaretskaya, Kim, 2018). Construction of new plants should be taken into consideration, as well as expansion of existing ones, which have partially contributed to such statistics. Level of capacity utilization for LNG varies from country to country and from the needs of the domestic market during the season. 2019 was a record year for use of LNG at Union level, and amount to close to 50% by September, in contrast to 2018 when the average was 26% (Market Observatory for Energy, 2019). Higher utilization of LNG import terminals is explained with increased competition and supply on the LNG market, as well as lower demand on the Asian market, which is the leading importing market for LNG.

Another aspect of the status quo in the LNG sector relates to maintaining the existing level of LNG imports, even in the case of constructing new or expanding existing terminals and capacities for receiving LNG. This is closely related to what we said earlier, in terms of capacity utilization for LNG reception and regasification in the European Union. Construction of new LNG plants does not necessarily lead to increased imports of liquified natural gas. There are a number of reasons why higher capacity utilization isn't achieved, such as higher gas imports supplied by pipelines or the use of competitive energy sources, or periods of reduced demand for all energy sources. It seems that 2019 led to the termination of status quo when it comes to the import of LNG, because there was a significant increase in imports due to the increased supply of LNG on the world market. Unlike the markets of certain Asian countries such as Japan or Korea, in the European gas market, LNG will continue to compete with gas supplied by pipelines from third countries.

According to another possible scenario, there is an expansion in the LNG sector, both in terms of building new capacities or expanding existing ones, and in terms of importing LNG on the European market. This scenario fits into the framework of future planes of individual Union members that intend to expand the existing capacities or build new facilities for LNG import. In the previous part of the paper, we stated that a certain number of planned projects from the list of projects of common interest also apply to the LNG sector. Although a large number of LNG terminals have been built in previous years, most of them are allocated in south-west and west Europe. Investments related to infrastructure in the LNG sector largely depend on movement of gas prices on the market, on which their profitability is based. However, in addition to the economic calculation, significant attention is paid to the security aspect,

i.e., security of supply. Many countries are embracing projects in the LNG sector, in order to overcome possible problems in terms of uninterrupted supply, given the crisis related to gas transit through the pipeline. Expansion of capacity in the LNG sector is very likely if there is an increase in imports and demand for liquified gas in the Union. The example from 2019, when there was a record in import of LNG in EU member states, doesn't necessarily mean that this trend will continue. Union members can turn to LNG in case of increased supply on the world market, contributing to greater competition and lower prices. The advantage of the European LNG market is in the existing legal and regulatory framework, which allows third party access to terminals and the publication of tariffs and methodology (not related to the case of regime exemption). This enabled the European market to receive LNG when gas exporters couldn't find a place in the Asian market.

Finally, the third scenario implies regressive tendencies in the LNG sector. One of the reasons that may contribute to a decline of this sector is high price of LNG on the market compared to other competitive energy sources. First, LNG competes with natural gas that is delivered by pipelines. Although LNG has generally been more expensive over the years than pipeline gas, this may no longer be the case. Thanks to the progress of technology and construction of a large number of capacities for LNG, but also the entry of an increasing number of bidders on the market, it resulted in a significant reduction in prices of this gas. Gas price is also largely determined by distance from export terminals to the import terminals for import of LNG, i.e., transport costs. Other energy sources, such as coal, nuclear energy or renewable energy sources can compete with LNG. It's particularly important to transfer to clean, i.e., renewable energy source, where the question arises whether the use of fossil fuels should be reduced to the lowest level or eliminated completely as an energy source. Many consider natural gas as a transitional source of energy, until the complete transition to renewable energy sources. However, more than a few are advocating for cessation of using natural gas (despite lower emissions compared to coal and oil) as a part of the strategy of switching to renewable sources. This would ultimately affect the LNG sector, which would contribute to a general decline and regressive tendencies in this sector.

Conclusion

When it comes to competitiveness, i.e., perspective of competitiveness of the LNG market in the EU, it's important to start from the existing regulatory framework without which the tendencies and current situation on the natural gas market cannot be understood, and how the LNG market in Europe differs from LNG markets in other regions of the world. Since the beginning of the

liberalization process of the natural gas market, the LNG sector has also been the subject of new regulations adopted at the EU level. Today this sector is regulated by Third energy package regulations, as well as numerous legal acts that regulate the relationships on the natural gas market.

The European market has traditionally imported natural gas through a pipeline system from a number of surrounding countries. LNG market in the EU has been expanding in recent years thanks to the development of capacities and plants for receiving and regassifying LNG. In this paper, we presented a table of large-capacity terminals for importing LNG, which were mostly located in south-west and west Europe. Also, in addition to existing capacities, the construction of new capacities is planned, one of which is on the list of projects of common interest of the EU, which brings with it certain benefits in the preparation and implementation of the project.

Existence of a significant capacity for receiving liquified gas and plans for further expansion of capacity doesn't necessarily entail larger LNG trade, i.e., its full utilization. We presented possible scenarios when it comes to competitiveness of LNG on the EU market in the part of the paper dedicated to discussion. Even though there was a significant import of LNG in EU in 2019 compared to previous years, we believe that this trend does not necessarily have to be linear in the future. Current situation on the gas market in Europe indicates that the pipeline mode of transport will continue to be represented in relation to import of LNG, and that this trend is largely conditioned by price competitiveness of gas supplied by gas lines. This is supported by a larger number of new gas pipeline projects in Europe, which are being implemented in parallel with projects in the field of LNG, which means that European countries have not given up on this way of delivering natural gas.

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