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Hrvatska agencija za poštu i elektroničke komunikacije

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PREDMET: Javna rasprava – Troškovni modeli za nepokretnu i pokretnu mrežu i univerzalne usluge

VIPnet d.o.o. (dalje u tekstu: Vipnet) kao operator javne pokretne i nepokretne komunikacijske mreže pozdravlja inicijativu Hrvatske agencije za poštu i elektroničke komunikacije (dalje u tekstu: HAKOM) da otvori javnu raspravu vezano za Prijedlog troškovnih modela, s naglaskom na troškovni model za pokretnu mrežu, a s ciljem omogućavanja razmjene argumentacije i činjenica u svrhu donošenja konačne odluke o troškovnim modelima koji će se primijeniti na regulirane usluge operatora sa značajnom tržišnom snagom tijekom 2012. godine, sukladno prezentiranom planu HAKOM-a.

S obzirom da je Vipnet u svrhu izrade što kvalitetnijih komentara na predloženi dokument angažirao stručnjake tvrtke Ovum Consulting iz Londona, Ujedinjeno Kraljevstvo, kao etablirane inozemne konzultantske kuće sa značajnim međunarodnim iskustvom u izradi i evaluaciji troškovnih modela i s prepoznatim nizom referenci u regiji, Europi i na globalnoj razini, dio komentara Vipneta bit će izrađen u hrvatskom jeziku a dio komentara na engleskom jeziku.

Stoga, molimo HAKOM da sve ovim putem dostavljene komentare Vipneta i konkretne prijedloge izmjena i dopuna predloženih principa troškovnih modela, bez obzira na jezik u kojem su pisani, uvaži s istom pozornošću.

Vipnet će se u svojim komentarima prvenstveno osvrnuti na dijelove predloženog dokumenta na temu troškovnog modela za međupovezivanje u pokretnoj mreži, pri čemu koncipiramo naše komentare odgovorima na, od strane HAKOM-a, postavljena pitanja, kako slijedi:

Pitanje 1: Koje je vaše mišljenje o korištenju modela "odozdo prema gore" kako predlaže HAKOM?

S obzirom da se Vipnet u svojim komentarima prvenstveno referira na temu troškovnog modela za međupovezivanje u pokretnoj mreži, te s obzirom na preporuku Europske Komisije o primjeni određene vrste modela za izračun troškovno orijentirane cijene terminacije u pokretnu mrežu, a pošto se HAKOM referira u svom opširnom obrazloženju na pitanje 1. prvenstveno na usluge veleprodajnog pristupa u nepokretnim mrežama, Vipnet će svoje komentare na ovo pitanje dostaviti u odgovorima na daljnja pitanja.

Pitanje 2: Koje je vaše mišljenje o provođenju LRAIC+ pristupa za sve usluge, a LRAIC+ pristupa i „čistog“ LRIC pristupa za određene usluge jezgrenog dijela nepokretne mreže i pokretne mreže?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u privitku ovom dokumentu, na engleskom jeziku.

Pitanje 3: Koje je vaše mišljenje o predloženim pristupima za izračun OPEX-a u troškovnim modelima "odozdo prema gore"?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 4: Koje je vaše mišljenje o primjeni metode raspodjele „prema potrebnom kapacitetu“ i metode *Shapley-Shubik* za zajednicke i združene mrežne troškove u modelima "odozdo prema gore"?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 7: Koje je vaše mišljenje o primjeni metode kosih anuiteta ili metode prilagođenih kosih anuiteta pri izradi troškovnih modela "odozdo prema gore"?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 8: Koje je vaše mišljenje o primjeni ekonomskog vijeka trajanja imovine u modelima "odozdo prema gore"?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 9: Koje je vaše mišljenje o prijedlogu HAKOM-a da nije potrebno uključiti radni kapital koji nije vezan uz mrežne aktivnosti ili pružanje usluga?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 10: Koje je vaše mišljenje o prijedlogu HAKOM-a da, osim radnog kapitala koji je generirao CAPEX koji bi se trebao uzeti u obzir kroz formule amortizacije, trošak radnog kapitala vezan uz mrežni OPEX ne bi trebalo uzeti u obzir prilikom troškovnih modela?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u pravitku ovom dokumentu, na engleskom jeziku.

Pitanje 11: Koje je vaše mišljenje o predloženom načinu izračuna WACC-a?

Odgovor na pitanje o predloženom načinu izračuna WACC-a ćemo moći dostaviti nakon što dobijemo uvid u konačni izračun i korištene pretpostavke.

Pitanje 14: Koje je vaše mišljenje o korištenju godišnjeg pristupa optimizaciji dimenzioniranja mreže pri izradi troškovnih modela "odozdo prema gore"?

Na ovo pitanje Vipnet dostavlja komentare izrađene od strane konzultantske tvrtke Ovum Consulting, u privitku ovom dokumentu, na engleskom jeziku.

Pitanje 15: Koje je vaše mišljenje o vrsti operatora koje HAKOM planira modelirati?

Na temu prijedloga modeliranja generičkog operatora pokretnih mreža, i navedenu preporuku Europske komisije o regulaciji cijena završavanja u pokretnu mrežu generičkog operatora, sukladno kojima HAKOM predlaže da se za generičkog operatora preporuča koristiti 20% tržišnog udjela, izražavamo našu punu suglasnost na predloženi postotak tržišnog udjela generičkog operatora.

Pitanje 17: Koje je vaše mišljenje o početnom stajalištu HAKOM-a o vrsti tehnologija (2G i 3G) koje će se modelirati?

Kao što je i HAKOM utvrdio, operatori pokretne mreže u Republici Hrvatskoj - HT, Vipnet i Tele2, primjenjuju 2G i 3G tehnologije zbog čega je opravdano i nadasve neophodno modelirati obje tehnologije, a što je u skladu i s preporukom Europske komisije o modeliranju kombinacije tehnologija 2G i 3G.

Stoga model treba apsolutno biti utemeljen na 2G i 3G tehnologijama u pristupnom dijelu mreže kako bi mogao odražavati situaciju s kojom se operatori suočavaju.

Pitanje 18: Koje je vaše mišljenje o početnom stajalištu HAKOM-a vezano uz spektar koji je potrebno uzeti u obzir kod modeliranja troškova pokretnih mreža?

Kao što je i HAKOM utvrdio, HT, Vipnet i Tele 2 imaju dodijeljene različite dijelove i količine spektra što zbog različitog broja potrebnih baznih stanica stvara razlike u troškovima opreme.

Za modeliranje "generičkog operatora", HAKOM predlaže korištenje prosječne dodjele spektra, prikazane u tablici 7. pod nazivom Dodjela frekvencijskog spektra operatorima pokretne mreže u Hrvatskoj i generičkom operatoru.

U navedenoj tablici potrebno je, radi točnosti primijenjene metode, izmijeniti podatak o dodijeljenom radiofrekvencijskom spektru HT-u u pojasu GSM 1800, gdje HT ima 20,0 MHz, pa time i podatak o dodjeli frekvencijskog spektra generičkom operatoru za pojas GSM 1800 treba biti svakako višeg iznosa od navedenog u tablici, odnosno, 14 MHz.

Međutim, općeniti komentar na cijelu tablicu 7. odnosi se na činjenicu da su u stvarnosti, operatorima pokretnih mreža dodijeljene količine radiofrekvencijskog spektra u pravilu dvostruke od ovih navedenih u tablici 7. jer je operatorima u pravilu dodijeljen upareni radiofrekvencijski spektar, izuzev jednog bloka od 5 MHz u UMTS (3G) području.

Također, ne smije se zanemariti činjenica da su današnje dozvole za uporabu radiofrekvencijskog spektra dodijeljene HT-u, Vipnetu i Tele2 isključivo tehnološki neutralne, te da se svi navedeni radiofrekvencijski pojasevi mogu koristiti i za tehnologije 2G i 3G, a uskoro i za 4G, te ove činjenice svakako treba uzeti u obzir.

Stoga predlažemo da se predmetna tablica 7. izmjeni na slijedeći način:

Dodjele Ukupna širina pojasa (MHz)	HT	Vipnet	Tele2	Generički operator
900	28.8	28.8	10.0	22.5
1800	40.0	20.0	24.0	28.0
2100	35.0	35.0	35.0	35.0

Zaključno, i HAKOM je u svom dokumentu utvrdio činjenicu da što su veći frekvencijski pojasevi dodijeljeni operatoru, da to nužno ne može značiti da je i manji broj potrebnih baznih stanica, i da su time i troškovi tog operatora u pružanju usluga niži.

Štoviše, HAKOM je jasno naveo da kod određene količine spektra može biti da dodatna količina spektra ne omogućuje uštedu troškova, te molimo HAKOM da ovim činjenicama posebno posveti pozornost u izradi troškovnog modela i prihvaćanju ovdje navedenih komentara.

Pitanje 19: Koje je vaše mišljenje o početnom stajalištu HAKOM-a o postupanju s troškovima dozvola i naknadama za uporabu frekvencija?

Troškovi dozvola za uporabu radiofrekvencijskog spektra za 2G i 3G tehnologije, predstavljaju i predstavljat će značajne i iznimne troškove operatorima pokretnih mreža, posebice uslijed primjene dodjele radiofrekvencijskog spektra putem postupka javne dražbe.

Također, uvjerenja smo da HAKOM ima uvid u iznose takvih naknada u drugim zemljama, kao i u činjenicu da se predmetne naknade razlikuju od države do države, i da su samostalno definirane od strane država ili nacionalnih regulatora, bez uobičajenih ili preporučenih cjenovnih okvira od strane Europske komisije.

Stoga smatramo da je kod izrade modela apsolutno neophodno uzeti u obzir troškove dozvole, koji uključuju:

- jednokratne troškove (konkretno 50 milijuna kuna plaćenih za dozvole za radiofrekvencijski spektar 900/1800 MHz 2009. godine)
- periodičke godišnje troškove sukladno Pravilniku o plaćanju naknada za pravo uporabe adresa, brojeva i radiofrekvencijskog spektra i Pravilniku o plaćanju naknada za obavljanje poslova HAKOM-a.

Navedeni troškovi naknada i dozvola za uporabu radiofrekvencijskog spektra, kao temeljnih dokumenata za obavljanje djelatnosti javno dostupnih komunikacijskih usluga u pokretnoj mreži, predstavljaju operatorima značajne i neosporive troškove, koje je neophodno kategorizirati kao troškove mreže jer se isti i odnose na rad mreže.

Također, izražavamo neslaganje s pretpostavkom HAKOM-a da bi troškovi dozvole generičkog operatora trebali biti utemeljeni na naknadi za dozvolu posljednjeg operatora koji je ušao na tržište u Republici Hrvatskoj, niti se ne možemo složiti s tvrdnjom da se tako najbolje odražava stvarna vrijednost takve dozvole u konkurentnom okruženju s tri operatora.

Naime, Tele2 kao posljednji operator koji je ušao na tržište u RH, dobio je inicijalno dozvole za uporabu radiofrekvencijskog spektra zajednički za radijske frekvencije u pojasevima 900 MHz i 1800 MHz i 2100 Mhz, i tijekom 2009. godine nije bio primoran uplatiti u državni proračun i jednokratne iznose naknada od 50 milijuna kuna za dozvolu za uporabu radiofrekvencijskog spektra u prvoj godini, kako su to morali uraditi HT i Vipnet.

Stoga, ne možemo podržati prijedlog HAKOM-a da bi troškovi dozvole generičkog operatora trebali biti utemeljeni na naknadi za dozvolu posljednjeg operatora koji je ušao na tržište u Republici Hrvatskoj.

Pitanje 22: Koje je vaše mišljenje o odabiru „scorched node” pristupa u izradi troškovnih modela "odozdo prema gore"?

HAKOM je korektno uočio činjenicu da se pri određivanju lokacija baznih stanica primjenjuju mnoga ograničenja, kao što su tehnička ograničenja (npr. potreba za velikim brojem pristupnih točaka kako bi se osigurala optimalna pokrivenost), ali i administrativna ograničenja koja nije moguće jednostavno modelirati, a s obzirom da operatori pokretnih mreža imaju sve više problema s pronalaženjem lokacija za bazne stanice jer lokalne vlasti ponekad nameću ograničenja u odnosu na gustoću i/ili smještaj baznih stanica.

Suglasni smo da je iz navedenih razloga svakako potrebno uzeti postojeću topologiju mreže kao početnu točku za proces raspodjele troškova. Takav „scorched node” pristup značio bi zadržavanje postojećih pristupnih čvorova.

Podržavamo stajalište HAKOM-a da je potrebno koristiti „scorched node” pristup za modele pokretne mreže jer se temelji na ostvarivoj razini učinkovitosti.

Pitanje 24: Koje je vaše mišljenje o početnom stajalištu HAKOM-a da bi u nekim slučajevima moglo biti nužno koristiti postupno određivanje cijena?

Kako to i HAKOM sam navodi i utvrđuje, u slučaju da primjena modela "odozdo prema gore" pokaže da troškovno usmjerena cijena znatno odstupa od postojećih reguliranih cijena, moglo bi biti prikladno razmotriti postavljanja cijena na razinu troška nakon određenog razdoblja. Takav način određivanja cijena naziva se postupnim određivanjem cijena ili „glide-path”.

Takav pristup, prema HAKOM-u, operatorima daje vremena da planiraju smanjenje prihoda i nudi im stabilnost umjesto naglog šoka u slučaju da se troškovno usmjerena cijena počne odmah koristiti.

Dodatno, HAKOM smatra da bi u slučaju značajne razlike između postojećih cijena i troškovno usmjerenih cijena na temelju modela "odozdo prema gore" moglo biti prikladno razmotriti primjenu postupnog određivanja cijena kao prijelaznog mehanizma prema razini utemeljenoj na stvarnim troškovima. Međutim, HAKOM isto smatra da primjena postupnog određivanja cijena produljuje razdoblje tijekom kojeg cijene ostaju iznad stvarnog troška i tako odgađa dobrobit korisnika koja proizlazi iz troškovno usmjerenih cijena. HAKOM će isto uzeti u obzir kod određivanja odgovarajućeg trajanja postupnog određivanja cijena („glide-path”).

Mi bismo ovdje skrenuli pozornost na činjenice o kojima smo već izvješćivali HAKOM.

Poseban i izrazit problem nastaje po pitanju regulacije cijena terminacije međunarodnih poziva u nacionalne pokretne mreže, u kojem segmentu će, u slučaju izjednačavanja pojmova nacionalne i međunarodne terminacije, biti očito drastičan pad cijene te veleprodajne usluge.

Moguća buduća regulacija cijena terminacije u pokretne javne komunikacijske mreže donosi negativan učinak na cijelu industriju pokretnih elektroničkih komunikacija u obliku gubitaka prihoda, što može dovesti do neželjenih efekata na tržištu elektroničkih komunikacijskih usluga, kao što su:

- Osjetno otežavanje daljnjih investicija,
- Pad vrijednosti oglašanih dionica na burzama,
- Nužnost uvođenja novih mjera smanjenja operativnih troškova,
- Moguća smanjenja broja zaposlenih,
- Smanjenja iznosa naknada koje operatori uplaćuju za financiranje rada HAKOM-a i za doprinose u državni proračun RH,
- Cjelokupni doprinos tržišta pokretnih elektroničkih komunikacijskih mreža i usluga u BDP-u i naposljetku, gospodarskom oporavku RH.

Istovremeno, uslijed daljnjeg dramatičnog pada prihoda nacionalnih operatora pokretnih javnih komunikacijskih usluga, i njihovog ostvarenja ciljeva investitora i vlasnika kompanija, potpuno je opravdano očekivati i rast maloprodajnih cijena usluga postojećim krajnjim korisnicima, u cilju neutralizacije negativnih efekata predmetne regulacije. Stoga je sasvim razvidno, da bi predmetna regulacija definitivno negativno utjecala na krajnje korisnike nacionalnih operatora.

Apsolutno zastupamo čvrsto stajalište da je postupno određivanje cijena („glide-path“) neophodno, te da će se takvim definiranjem novih cijena terminacije poziva u pokretne javne komunikacijske mreže postići slijedeći efekti:

- ublažiti će se negativni utjecaji gospodarske krize i dodatnih financijskih opterećenja na industriju pokretnih elektroničkih komunikacija i cjelokupno nacionalno gospodarstvo i makroekonomske pokazatelje,
- izbjeći će se negativni utjecaji na krajnje korisnike,
- dat će se izravan poticaj industriji pokretnih elektroničkih komunikacija u novim investicijskim ciklusima, posebice u okviru ispunjenju ciljeva Digital Agende i nacionalne strategije broadbanda donesene od strane Vlade RH u studenom 2011. godine,
- osigurati će se usporedivi trend pada cijena terminacije poziva u pokretne javne komunikacijske mreže u Hrvatskoj u odnosu na prosječan pad cijena terminacije u zemljama zapadne Europe i CEE zemljama, o kojima dostavljamo i niže prikazanu argumentaciju, putem izvještaja Cullen Internationala, kako je prikazano u prilogima ovog dokumenta, i kako slijedi:
 - Austrija – glidepath uveden sredinom 2009. godine na dvije godine
 - Belgija – glidepath uveden sredinom 2010. godine na 3 godine
 - Danska – glidepath uveden sredinom 2008. godine na 4,5 godine
 - Francuska – glidepath uveden sredinom 2010. godine na 3 godine
 - Njemačka – glidepath uveden krajem 2006. godine na 6 godina
 - Grčka – glidepath uveden krajem 2008. godine na 2 godine
 - Irska – glidepath uveden početkom 2010. godine na 3 godine
 - Italija – glidepath uveden sredinom 2006. godine na 5 godina
 - Francuska – glidepath uveden sredinom 2010. godine na 2 godine
 - Norveška – glidepath uveden početkom 2011. godine na 3 godine
 - itd.

- poseban dio regulacije MTR-a putem glidepatha predstavlja izjednačenje cijena terminacije međunarodnog prometa na razinu cijena terminacije nacionalnog prometa, te je sukladno tome nužno na prikladan i racionalan način produljiti trajanje razdoblja glidepatha.

Pitanje 29: Koje je vaše mišljenje o očekivanim vremenskim rokovima za izradu i primjenu troškovnih modela "odozdo prema gore"?

HAKOM očekuje da će 1. korak (prikupljanje podataka) i 2. korak (izrada modela) početi u prvom tromjesečju 2012., dok će 3. korak (provjera ispravnosti) biti dovršen do kraja 2. tromjesečja 2012. godine. Međutim, potrebno je napomenuti da očekivani vremenski raspored uvelike ovisi o fazi prikupljanja podataka koja će zahtijevati potpunu suradnju s operatorima.

U skladu s tom napomenom HAKOM-a, željeli bismo skrenuti pozornost da je, uz zajamčenu suradnju operatora, neophodno od strane HAKOM-a prilagoditi i same zahtjeve HAKOM-a za podacima, koji moraju biti jasni, jednoznačni i konzistentni, bez omogućavanja dvojakih tumačenja, i da neće iziskivati od operatora značajne prilagodbe i preinake postojećih sustava izvješćivanja radi osiguranja dostave traženih podataka u traženom formatu u traženim, vjerojatno kratkim rokovima.

Treba imati na umu da se izvještajni sustavi sva tri operatora pokretnih mreža zasigurno razlikuju te da isti nisu nikada međusobno usklađivani, te da svaki ima svoje vlastite specifičnosti.

Dodatno, nerazumne i neracionalne prilagodbe izvještajnih sustava sva tri operatora pokretnih mreža mogu uzrokovati dodatne neplanirane i neutemeljene troškove operatorima, kao i ozbiljne rokove implementacije, što može dovesti do neželjenih odgoda rokova dostave podataka.

Pitanje 30: Koje je vaše mišljenje o ključnim koracima opisanim u ovom poglavlju koje je HAKOM predvidio za izradu, primjenu i provjeru ispravnosti troškovnih modela "odozdo prema gore"?

Za izradu troškovnih modela "odozdo prema gore" nužno je prikupiti podatke od operatora. Navedeni korak uključuje:

- Pripremu sveobuhvatnog upitnika za prikupljanje podataka od strane HAKOM-a;
- Radionice s operatorima radi pojašnjenja upitnika;
- Posjete pristupnoj mreži kako bi se razumjeli lokalni uvjeti i postojeća inženjerska pravila;
- Radionice s mjerodavnim operatorima radi definicije mjerodavnih topologija mreže, strukture mreže i inženjerskih pravila; i konačno
- Analizu podataka koje su dostavili mjerodavni operatori (uglavnom HT, Vipnet i Tele2).

Podržavamo ove nužne korake, posebice predložene radionice s operatorima u cilju pojašnjenja upitnika, i nadamo se i mogućih korekcija istih radi usklađenja s realnim mogućnostima operatora, bez kojih neće biti moguće izvršiti sve planirane radnje u traženim rokovima.

Pitanje 31: Koje je vaše mišljenje o predloženoj strategiji da se mjerodavni operatori (HT, Vipnet i Tele2) uključe u izradu i provjeru ispravnosti navedenih modela?

Pun angažman i uključenje ključnih operatora u postupak izrade i provjeru ispravnosti troškovnih modela je apsolutno potrebna i neophodna, te smo čvrstog stajališta da se ovakva praksa mora osigurati, odnosno, izražavamo punu suglasnost da u fazi provjere ispravnosti modela, HAKOM proslijedi modele operatorima i pozove na komentiranje istih.

Pri tom bi provjera ispravnosti modela trebala uključivati:

- Preispitivanje modela "odozdo prema gore" od strane operatora kako bi se osiguralo da modeli obuhvaćaju mjerodavnu imovinu i troškove i da funkcioniraju na valjan i siguran način;
- Usporedbu modela "odozdo prema gore" s modelom "odozgo prema dolje" i stvarnim podacima o mreži kako bi se utvrdile razlike me_u dobivenim rezultatima i, ako razlike postoje, njihovi uzroci.
- Analize osjetljivosti kako bi se provjerilo funkcioniranje i osjetljivost modela na ključne ulazne vrijednosti (npr. promet u vrijeme jakog prometa, metodologija raspodjele, predviđeni promet, cjenovni trendovi itd.);

Nadamo se da će ovaj naš komentar znatno pridonijeti uspjehu ove javne rasprave, te ujedno, uslijed ovdje istaknute činjenice da je značajna količina konačnih postavki troškovnog modela još u postupku definiranja, molimo HAKOM da uvaži i naš prijedlog da se po izvršenju analize svih prispjelih komentara zainteresiranih strana, i definiranja jednoznačnih smjernica (eng. guidelines) troškovnog modela HAKOM-a, održi još jedan krug javne rasprave u koju bi bili ponovno uključeni svi zainteresirani.

Srdačan pozdrav,
VIPnet d.o.o.

U pravitku:

Prilog 1: Dokument komentara, Ovum Consulting, London, UK

Prilog 2: Cullen International, October 2011, Mobile termination rates, Western Europe, Glidepaths

Prilog 3: Cullen International, October 2011, Mobile termination rates, CEE, Glidepaths

Prilog 1: Dokument komentara, Ovum Consulting, London, UK

Introduction

Ovum Europe Limited (“Ovum”) has been asked by Vipnet to comment on a limited number of the questions raised by the HAKOM consultation. This Prolog (Annex) provides the Ovum commentary. The commentary provides feedback that is aimed at furthering the consultation process and ensuring a calculation of the Mobile Termination Rate (MTR) that is in alignment with the needs of Croatia. This commentary is based on many years of experience advising operators and regulators on interconnection, regulatory and cost modelling issues. Ovum is well known in this field and has built or commented on many bottom up (BU) and top down (TD) models.

The HAKOM consultation provides an extensive discussion of cost models and interconnection in general. A large amount of this is very familiar and could be described as “standard” material that is generally accepted by specialists in the field. The Ovum comments ignore these points and focus mainly on controversial issues or gaps. It should be noted that where there are areas of the HAKOM consultation that are not commented on, this should *not* be taken as having been accepted or agreed to.

The Ovum commentary is only focussed on the issue of MTR and hence on mobile costing issues. Fixed network costing issues are not covered, except where they may be relevant to the MTR approach, for example as a contrast.

Summary of key point

We have looked at identifying and understanding how HAKOM is proposing to develop and implement the mobile cost models.

Our main comments are:

- The overall approach lacks clarity and transparency, hence a number of issues are likely to require further commentary before the models are built
- HAKOM lists alternatives that will all be calculated. There is no full description *which* approach HAKOM is proposing to follow for calculating the prices of the different services
- There is no clear indication on how cost (or other) data from the operators are going to be used and taken into account into calculating the prices of the different services in order to reflect the situation of the Croatian mobile operators
- Which services (if any) are going to be priced at Pure LRIC and how this is going to be calculated and modelled? For which other services, will LRIC+ be applied or will another methodology be used?
- How will the TD data from Vipnet will be used, and how will the BU model be calibrated fully to reflect the actual costs incurred by mobile operators in Croatia?
- What are the cost sources that will be used by HAKOM?

General comments

The HAKOM consultation discusses many costing and termination issues. Many of the issues are not fully clarified in the areas of:

- **What are the aims and desired outcomes that HAKOM seeks?**
- **Why these are the desired outcomes?**
- **What is the best economic/technical calculation approach to achieve this outcome (How the outcomes are to be achieved)?**

This means that a number of issues are likely to require further commentary once HAKOM builds the models (or ideally before they are built), or when it issues data requests and opens the model process for open and transparent review by the Croatian industry.

In the following we describe some of the general issues with the consultation and approach then move to the specific HAKOM questions.

The relative issues of top down and bottom up models are discussed at length, but it is not clear how the TD model data from Vipnet will be used or how will the BU model be calibrated fully to reflect the *actual* costs and reality of mobile operators in Croatia – as is shown by Vipnet’s actual costs and technical data.

Another aspect of concern is the discussion of efficiency. It is generally agreed that MTR should reflect the forward looking costs of an efficient operator. The HAKOM paper notes that TD models can include inefficient business costs. This is most often true for fixed incumbents that have legacy operational structures. There is of course no fundamental reason that TD model should have to include inefficiencies: they can be identified and removed. Furthermore a mobile operator such as Vipnet, that has developed in a competitive environment, surely cannot be pre-supposed to have inefficient operations. Why should an operator build out in an inefficient way given competitive and shareholder pressures? The onus would be on HAKOM to prove there are inefficient costs within Vipnet. It is *unlikely* that this could be proved other than to a very small level, based on the principle that: no telecom operator is absolutely perfect. Even if such small inefficiencies do exist: should the costs be based on such a hypothetical perfect business that might never exist?

This leads to a definition of inefficiency and how might it be defined. No operation is perfect: base station numbers and locations have local geography and planning rules to consider. Several years later, hindsight might suggest that alternative equipment numbers and locations would be more efficient. This is an unreasonable approach to efficiency. We note the “Scorched node” approach is to be followed by HAKOM where actual node numbers and locations are accepted. This is a sensible method as it accepts the actual engineering and business decisions taken by Vipnet were as efficient as an operator could reasonably be expected to take at the time in Croatia. Ovum supports this approach. By extension of this, equipment choices, vendor prices and operational costs must also reflect the actual current situation and history of Vipnet: there is no reason to suppose the business has not evolved in an efficient manner.

We cannot see how the modelled costs should not reflect Vipnet’s actual costs as it is not reasonable for HAKOM to be able to show that Vipnet is inefficient. Ovum experience of TD and BU models provides extensive data of mobile (and fixed) costs from other countries. HAKOM and its advisors may also have access to such data. The application of this to Croatia must, by definition, be approximate only. There are many local staffing, geographical factors, planning rules, equipment pricing issues, and other cost factors that make the conversion of data to Croatia inherently inaccurate. This does not mean that the

data is not valid for *some* purposes, however it is unlikely that this data could be a solid basis for evaluating any inefficiencies of Vipnet, since the fundamental assumption should be that Vipnet is efficient or very close to this. Conversion of general cost and modelling data to Croatia is not accurate enough to evaluate this small cost factor (the amount of inefficient cost).

We note there are a few sources of solid cost data that can be used to measure efficiencies. Stochastic frontier type analysis is possible to determine the theoretical efficient costs in other countries, if there is a large data source that is robust and can be analysed for the many parameters that impact costs (salaries, weather, geography, local loop lengths, population density etc.). The USA FCC ARMIS data is probably the only source of a large enough data set to carry out this analysis. This is done in a number of countries, but the data only covers legacy fixed network data. It is unlikely that other mobile data sources would be robust enough to provide a basis for evaluating that small (if any) inefficient costs that might exist in Vipnet.

In general Ovum is concerned about the cost sources that may be used in the modelling process by HAKOM. The consultation paper was not totally clear how data will be selected or verified. It may be presumed that HAKOM and its advisors may have access to cost data from other countries. Ovum has experience of this type of data as well. The key issues are: how accurate this is for Croatia and how can it be accurately defined to be a Croatian cost? If only an *approximate* MTR is desired, then it is reasonable for this data to be used. We believe the HAKOM aims are for a robust, accurate and transparent modelling approach. In this case Vipnet data should be considered the primary source data. Furthermore, cost data from non-specific other country models, general BU modelling rules-of-thumbs etc. are not acceptable: data must be Croatian and must be transparent and verifiable. Ovum is well aware that some BU model use data from other BU models and benchmarks and other approximations – HAKOM should reject this inaccurate approach.

The costs of MTR should normally be forward based (Long Run). The HAKOM consultation is not clear on how TD model data may or may not be part of this approach. TD models and data derived from them can be used as part of any LRIC approach. TD LRIC models are widely used. The TD values can be used to ensure a BU LRIC model is calibrated and reflects current and past costs. Both of these are vital as a BU LRIC model that cannot model current and past costs accurately *cannot* be considered robust for future costs. The implied HAKOM assumption that TD models are not suitable due to inefficiencies is not a valid point as inefficient costs can be removed from a TD model and in the case of Vipnet there is *no obvious reason to pre-suppose there are any significant inefficiencies*.

The HAKOM assumption is shown in the statement “LRIC can also be more difficult to implement with top-down models because of the presence of potential inefficiencies in the top-down costs.” See page 22. The problem with this is that it confuses efficiency and LRIC: the two issues are quite separate. TD models are often used to define LRIC based prices, TD models can be adjusted for inefficiencies. LRIC costs can be done in TD models if correct costs are used and some adjustments are used. We note TD CCA costing is one of the most widespread modelling approaches used in the EC: this can give LRIC like results and inefficient cost can be removed in a TD model (or they may get squeezed out by competition). If inefficiencies are the concern of HAKOM then, as Vipnet has no obvious reason to be inefficient, then there is *no reason* for HAKOM not to consider Vipnet TD data as a robust cost source for its modelling.

Ovum has not carried out any efficiency study of Vipnet, however there should be no reason to do this or a need for Vipnet to prove its efficiency. It would be for HAKOM to show the inefficiency (and we do not consider this is something that can be done in a robust manner without a lot of work and analysis that would probably be inaccurate).

Commentary on Question 2

“Do respondents agree with HAKOM’s preliminary view to implement the LRAIC+ approach for all services, and both the LRAIC+ and the pure LRIC approach for specific services handled by the fixed core and the mobile networks? Please elaborate.”

The approach causes some confusion. In general, a regulator should be able to define the desired approach before carrying out the investigation. This follows from having a transparent regulatory approach that defines, *in advance*, the:

- Aims
- The economic approaches and principles to achieve them
- How these are to be implemented.

This approach may be considered best practice. We note for example the initial Swedish PTS approach for BU and TD fixed models that defined the economic criteria and modelling methods in detailed model guidelines and reference papers. This was also done in Denmark. This was done *before* the models were made.

The HAKOM approach seems to have a number of modelling approaches that are not specified in detail and are open to experimentation and adjustment later. This suggests an approach that may be open to subjective adjustments. We note the following text:

“It is also HAKOM’s view that the pure LRIC approach may be appropriate in some circumstances, such as in the fixed and mobile networks for several services such as termination (as recommended by the European Commission).

Therefore, HAKOM proposes that the fixed core and mobile networks bottom-up models calculate the LRAIC+ of each service, and both the LRAIC+ and the pure LRIC for specific services⁴¹.”

Where the footer states:

“HAKOM notes however that it may be necessary in later stages and in specific cases to calculate the LRIC cost of a service with a different definition of the increment than the one of pure LRIC or LRAIC+”

This is confusing as it does not clearly state what approach will be taken by HAKOM for which service. This is unsatisfactory. This makes the question 2 almost pointless as of course *some* services may be at pure LRIC and some services may be at LRIC+. This is a non-controversial statement. The key questions are *what services* have been chosen to be at Pure LRIC and *why and what* are the implications for other services and the general economic outcomes of Vipnet and Croatian economy? The footer opens up an option that is neither LRAIC+ or pure LRIC – what is this and when would it be used? This means two methods will be calculated and a possible third method may be considered.

The approach lacks clarity and transparency. A regulator should be clear on its aims and on the approach taken to achieve these aims.

In the absence of clarity we analyse some of the earlier discourse in the consultation paper.

HAKOM states in Section 3.3 that an aim is to set prices that give the correct build or buy signals. This clearly happens with efficient LRIC+ prices: the other operator will build if it has a more efficient solution. The + means an inclusion of common costs, as these must be recovered and without this a cost floor would help to foreclose that market or else would raise other services' prices. Furthermore, such prices ought to follow in a competitive market. This is a generally well-held regulatory economic approach. Where there are bottlenecks then regulators intervene to replicate the competitive market outcome. This has resulted in cost-based prices for key services. For termination there is no real "build or buy" decision as the mobile termination is a non-contestable bottleneck. This still means that regulators have sought cost based prices to give the right economic signals and not to harm those seeking MTR services – as if it were contestable. This seems to have been acknowledged in Section 3.5.4.1, but this then also discusses historic costs and bottom up models. This steps into the huge current discussion area of access costing - the subject of the recent EC Questionnaire on Access costing. Ovum does not consider this further. We point out that HAKOM is not clear in its aims. Is it:

- To the use efficient LRIC+ to replicate the notional competitive market prices and theoretically correct build or buy signals (as if MTR were contestable)?
- Comply with the EC May 2009 Recommendation for pure LRIC?

Ovum notes that the LRIC+ versus the pure LRIC approach has been debated before, and the Recommendation is for pure LRIC. HAKOM seems to imply in some places pure LRIC for termination will be used (see page 25). Yet footer #41 implies something else *may* be used. This is not a clear statement of policy and it is not satisfactory to be unclear at this stage of what aims are. Aims, economic principles and approaches should be defined in advance, not after some numbers are examined or after a negotiation stage. Ovum does not know, with any certainty, what HAKOM intends to implement for MTR calculations.

HAKOM makes reference to the May 2009 EC Recommendation. This states a pure LRIC approach. *If* this is actually the approach to be followed by HAKOM, then this pure LRIC calculation method must be specified in detail in advance. Currently only general principles are specified. A more robust and transparent consultation approach would have included more clarity and a detailed list of modelling criteria and techniques to be employed. The absence requires additional work and arguably an *interim consultation* on the modelling guidelines to be made by HAKOM before a position paper and the models are finalised. This avoids problems of altering models that have already been constructed. Ovum is experienced in BU models, and we know how, once made, there is a major inertia that resists major alterations due the significant additional work. It is much easier to make the model correct first time than to alter an already-made model. Changing the HAKOM model may be required later as the consultation is currently not clear on the details of the approach that will be carried out.

Ovum makes the following preliminary discussion of the LRIC+ and Pure LRIC approaches. Both have arguments on their validity for MTR. This subject has been debated extensively. In general LRIC+ for MTR is widely considered a safe approach that causes no significant economic harm to competition and the markets (in contrast to higher than LRIC+ prices, which is generally accepted to be harmful for some customers). The debate is more on whether a *more optimum* outcome might occur with Pure LRIC or other low termination rates (*in extremis*: bill and keep). There are arguments for and against, as some lower retail prices may occur with pure LRIC, but higher prices may exist for other services or for some customer segments or else less investment may occur in some areas. The choice depends¹ on the outcomes that are desired. The HAKOM paper is not clear what the aims are or even if there is a clear case for the Pure LRIC approach.

¹ This assumes that the choice can be made independent of the EC Recommendation

No comment is made on the third costing method that may be used (neither LRIC+ nor pure LRIC) as this is not specified by HAKOM.

We note that the EC Recommendations was concerned with (among other things) the differences of MTR and fixed termination rates (FTR). See page one of the Recommendation. We note that pure LRIC for both may *increase* the relative differences². There is certainly no sign that lower MTR (from pure LRIC) is not equalled by lower FTR for the same reason – leaving the same price ratios in place. We note the anomaly of countries that are introducing pure LRIC for MTR and delaying or ignoring the same approach for fixed – this is odd as if one approach is correct for mobile, then surely it is also correct for fixed. Again the “best” outcome depends on the fundamental aims of HAKOM. Also the determination of termination rates has to be part of a wider price setting process that considers other regulations and access controls. These are not addressed in the consultation. An open and holistic approach to MTR and FTR should have considered issues such as:

- The use of call back and similar methods to exploit sub-full-LRIC MTR. What controls are allowed?
- Could pure LRIC be used for call access regulation, given that in the past, access prices have been similar to termination?
- What other services (if any) would pure LRIC be applied to? Could data or SMS be included and if so: why?
- Would pure LRIC prices be available to any all termination service seekers or only to players with roughly similar traffic flows or to those with a reasonable scale of network investment³?
- Should call termination be at LRIC+ to give the right outcomes for Croatia? The HAKOM paper implies this is being considered – something that Vipnet (and Vodafone⁴) for example supports.

The EC Recommendation has sided with Pure LRIC. *If* this is the approach to be taken, then clarity is required on the detailed modelling approach. In the following we describe a number of pure LRIC costing issues that need to be considered. If Pure LRIC is done then it must be done properly: the process should not be one that simply comes up with a “low MTR.” Pure LRIC approaches should employ the following methods and consider the following points:

- The Recommendation proposes Pure LRIC based on a BU model. The key requirement is *correct* pure LRIC calculations. This could be done with TD models (is there were no inefficient costs). We assume HAKOM intends to use a BU model. This should be done with correct cost data and it should include *appropriate* data from the Vipnet accounts, assets and network to ensure the BU model is accurate. HAKOM should confirm that the Vipnet data will be used to ensure correct results.
- The HAKOM model must be calibrated to reality. The BU model should be structured to show correct past network costs and structures. Therefore historic equipment numbers, staff costs and costs should be accurately reflected in the model. This is vital, as a BU model must model costs depending on realistic demands, and if it cannot model the past cost-volumes structures than it

² This might follow as FTR marginal costs could be very small

³ This has a logic where HAKOM seeks to encourage network investment and infrastructure competition, and not simply retail competition and traffic re-sellers who give much less long term economic benefits. This comment also relates to the lack of clarity of HAKOM’s ai

⁴ Vodafone comments on the Draft Commission Recommendation on the regulatory treatment of fixed and mobile termination rates in Europe 1 September 2008

cannot be trusted to model future, long run costs. HAKOM should confirm that this approach is included in the modelling method. Calibration to actual Vipnet service costs is improved by using full LRIC+ as this should give results similar to a Vipnet cost calculation – therefore the use of LRIC+ by HAKOM is supported even if this is not used for the price setting (Vipnet recommends LRIC+ and section 5.1.2 implies this is accepted by HAKOM as joint and network common costs are included). Furthermore, Vipnet does not claim that only its own costs and network structures (current and past) should be used to calibrate the model. The model should also consider the costs of other operators (assuming they also submit data that is as robust and as economically valid as Vipnet’s data). HAKOM seems to agree to this in the consultation by noting the different market shares of each player in fig 22 – this must be confirmed.

- The HAKOM model (as specified in the consultation) should define the cost based on a hypothetical 20% market share operator. HAKOM should specify how the model will be able to accurately adjust the costs to reflect this market size. This also needs to be done in a way that it can be calibrated to actual networks that exist in Croatia today with other market share percentages.
- HAKOM says the LRIC+ and pure LRIC may be calculated. LRIC + can assist the model accuracy as it is easier to calibrate this to actual efficient TD costs (as noted above). An issue is that a good LRIC+ model is not necessarily one that calculates pure LRIC correctly. Examples of some of the problems are expanded on elsewhere in this annex.
- Vipnet (and probably other mobile operators) will be able to supply data on costs and volumes as well as other technical parameters. This can show how costs have varied over time with increasing traffic demand. This correlation of costs with traffic volumes should be reflected in the HAKOM model. HAKOM should specify how these factors will be included and accurately reflected in the model.
- 2G and 3G technologies are stated by HAKOM, to be modelled. HAKOM should clarify how these are to be modelled to reflect the actual costs that were (and are) being efficiently incurred by Vipnet. Specifically HAKOM should confirm that the model will not be based on an unreal hypothetical operator that is biased to one or other cost structure, simply because it has a lower cost. This outcome is not acceptable as it will not reflect actual Croatian business costs.
- Ovum is very aware that BU models have been widely used to determine LR(A)IC and LRIC+ costs. Accurate results can be made, even with relatively inaccurate Cost-Volume-Relationship functions (CVRs). This is because the overall costs are calibrated and a full LRIC approach is used so that the entire business costs are allocated to products and services. Therefore joint costs are included. For example a network management system is common to many products or many network elements, but in full LRIC models, it is included. As a result the key requirement is to get the cost defined accurately, but it is not *so* important in most BU models to accurately define the CVR shape. As HAKOM needs to consider *pure* LRIC then this CVR function is a *critical* issue: if the avoided cost is calculated, then the lack of a solid CVR will give the *wrong* answer. A pure LRIC BU model therefore has to be much more exact with the CVR definitions than a normal LRIC model. It is not possible to simply re-use a normal BU LRIC model for pure LRIC without significant change. Example: the network management system⁵ will be driven significantly by traffic demand

⁵ Another example is the HLR. A BU LRIC model might not vary this cost with traffic and customers (the two are closely related) as the cost is anyway recovered by the service. It is unlikely that any mobiles have not increased investments over

and by equipment numbers (which in turn are driven by traffic of all types), but this might not be modelled in a full LRIC model. HAKOM should confirm and clarify how all the CVR functions are to be accurately defined for all cost elements.

- Spectrum costs, spectrum allocations and licence costs are critical to the solidity of any BU model. HAKOM should clarify how these costs are to be included. Spectrum costs are traffic driven. Even if spectrum trading is not yet in place, in principle this can or will occur. The scarce (and expensive resource) in theory should be traded and optimised to meet each operator's need. This gives efficient outcomes. As a result this means that spectrum costs are traffic related and must be considered variable cost to every service, including termination. This is reinforced by the technical fact that the same amount of spectrum is reserved for an inbound call as any other call (an inbound call could exclude and on net call being made). HAKOM should confirm this principle: the spectrum is driven by all traffic types.
- Licence fees are similar to spectrum, ultimately traffic-related. Efficient economic outcomes are increased if a hypothetical player with 1% of a market's traffic is not burdened with licence costs equivalent to a 20% or 50% market share player. HAKOM should confirm such costs are ultimately traffic driven and should not be treated as common business costs (such as audit fees⁶). This is a variation of the comments by HAKOM on pp59-60. We believe the GSMA approach was defined without consideration of pure LRIC modelling (HAKOM quotes a statement from 2008, *before* the EC Recommendation) and the approach then was to include common business costs as costing was then mostly based on LRIC+. In this case the CVR function and cost driver of License and Spectrum costs was less important – as the costs were recovered anyway. HAKOM is making a pure LRIC model, so these issues are significant and need to be specified and clarified fully in advance. Licence costs should take a long run view, any recent issue of cheap licenses to aid competition entry (a common regulatory approach) are therefore *not* relevant in the evaluation of licence costs - the relevant cost is the long run economic future value of licences.
- The choice of spectrum on urban and rural areas must reflect the efficient reality of *operators in Croatia*. We do not see a reason why spectrum use should be optimised unless all operators in Croatia have had, and will have, access to the optimum spectrum. If historically an operator was not able to have different spectrum deployments, then it should not be pushed to a cost base (and cost model) that it was (or is) not able to achieve. HAKOM should confirm that costs will reflect the reality of costs and spectrum access that Vipnet has had, and will have, access to. If, in the past, rural areas were not GSM 900 based and urban areas GSM 1800 based, this need not imply any inefficiency on the mobile operator's part. Since HAKOM has agreed to the scorched node principle and so HAKOM has accepted that past historic investment decisions have to be included, then this must also mean past spectrum-related costs and the resulting network configurations must be accepted costs. HAKOM should confirm this.
- Modularity of network components. A pure LRIC model is sensitive to the approach and assumptions. Short run cost calculations might suggest that some components are not altered by the termination traffic, whilst in the long run clearly almost all network elements are related to

time as traffic has growth: the cost *is* ultimately traffic driven but conventional BU LRIC models probably did not model this fact in a CVR

⁶ We note that audit fees are not truly a fixed cost, in some situations, and tend to be larger for larger businesses: i.e. revenue related. Revenue is related to traffic. It is noted that costs such as audit are usually considered as “common business” and effectively as a fixed cost, in many models

traffic and so are driven by the termination traffic. HAKOM should be clear about how this issue is to be addressed.

- In other parts of the consultation HAKOM states that the Shapley-Shubick method may be used: “capacity allocation method should be implemented along with the Shapley-Shubik allocation method which could provide useful insights.” See page 1. This is an unclear statement: “may” and “useful insights.” Either HAKOM intends to do it or not. What are the insights and how are they to be used? We believe the Shapley-Shubik approach should reduce the modularity issues because a cost model with say 10 services should then have the costs calculated with all possible orders of products’ deployment. This means that termination or on-net calls can be the first, second third etc. product deployed. This gives a better picture of the true long run incremental costs as modularity costing issues do not mask the long costs issues⁷. We note that the combinatorial calculations can be significant⁸. HAKOM should confirm the reasons for Shapley-Shubick and how the model will ensure long run incremental costs are accurately defined, and not short run costs.
- Coverage costs. The HAKOM approach is not clear about how this is dealt with. It is an issue that also relates to the temporal design of the model. Some costs may be considered to be related to coverage and are not traffic related. This is a much-argued issue as, why would any expense be incurred if it were not there to deliver services? There is no “coverage service” – so what should contribute to the investment? The definition is somewhat hypothetical as no base station has ever, to our knowledge, been designed not to carry traffic. The fixed network, in contrast, has the local loop and there is certainly no direct equivalent of this in mobile networks. It is possible that a small amount of cost is assigned to coverage. This should surely be the initial costs to give some coverage at the start of the business build out i.e. coverage in anticipation of traffic. This cost should *not* be revised each year of the BU model. Here, we assume that the BU model follows normal practice and is enhanced to produce costs for a number of years: 2010, 2011, 2012, 2013 etc. This is an important issue as the coverage cost should not be revised annually to another value, but would be the coverage cost derived in the first year. Another factor is what spectrum is considered for the coverage? 1800MHz only for coverage would give a very odd (incorrect) result.
- Modelling coverage. Some full LRIC models were designed to have some coverage analysis. It is unlikely that such models would give correct results for a pure LRIC analysis as the coverage costs were usually recovered anyway, so the accuracy did not matter significantly. Also the relevant cost might need to be evaluated on a very detailed base station by base station basis – simple rules of thumb for all geotypes may well be inaccurate. Vipnet maintains little or no costs should be excluded on the grounds of being coverage related. HAKOM should confirm and clarify this.
- Short and long run costs. The temporal issues are important. Short run analysis of costs can give a false view of joint costs and fixed costs – in the long run more costs are revealed to be variable.

⁷ Modularity and long run are fundamentally separate points. But, incremental costs may be defined by the simple subtraction of a service. Due to modularity issues this could cause almost no cost change or else it might cause a huge increase as the few minutes of avoided traffic allows a whole MSC to be removed. Clearly a long run view would require for the potential for the avoided service to, on average, contribute to an MSC, but not fully and not give zero contribution to the MSC. We support the Shapley Shibik approach if this error is reduced

⁸ See HAKOM comment: “after reviewing every possible order of arrival of the increment”

- Data service costing. HAKOM has little comment on data services and how these are to be modelled. They exist and have an increasing impact on mobile businesses. The approach to data inclusion in the model is required to be clarified, before the model is developed.

The above discourse is not a comprehensive review of pure LRIC and it is not a full definition of the exact approach required. It serves to show a number of areas that have not been addressed fully by HAKOM. It shows that the general aims and approach to be used by HAKOM have (as yet) not been fully defined. It is appreciated that HAKOM is in a consultation phase and so is seeking industry inputs. This consultation paper and Vipnet/Ovum paper is part of the input stages. The next stage is to make a clear definition of the actual aims and the detailed modelling approach. This is recommended before a model is made and data requests are issued. Once the model is ready and opened to Vipnet inspection, then a lot of work could be required to make changes - work that could be avoided by a clearer definition of the approach in advance.

The HAKOM approach also defines LRIC+ calculations for *all* services as defined in the question 2. Although the LRIC+ method is not fully defined in detail, Ovum assumes this follows other BU models and allows full cost-recovery and inclusion of the common business costs (typically on a mark-up basis). The method ought to be less controversial and less risky than pure LRIC. In any event the LRIC+ method ought to be defined in greater detail along with pure LRIC, in the consultation. A follow on from this is the question of which services are at pure LRIC and which are defined at LRIC+. Since pure LRIC only covers some costs, then HAKOM must be clearer on what services it assumes must bear the rest of the cost (retail or wholesale or both).

A further issue of LRIC+ is that of calibration. We support LRIC+ as data from a TD model (with inefficient cost excluded) should be able to calibrate the BU LRIC model to give the same results. HAKOM should clarify that this cost-calibration will be included, if service providers deliver TD cost data for 2010, 2011 or earlier years.

Commentary on Question 3

“Do respondents agree with HAKOM’s preliminary view on the appropriate approach to calculate OPEX in bottom-up cost models?”

The discourse by HAKOM is confusing. It states:

“HAKOM’s preliminary view is that operating costs should be calculated using the operators’ actual costs (top-down) with adjustments (approach b) or with a bottom-up calculation (approach c) depending on the feasibility (e.g. information availability) of both approaches. A top-down approach for the calculation of OPEX (approach a) is not consistent with the principle of the bottom-up approach as inefficiencies and irrelevant costs may be included.”

This does not state what HAKOM intends to do but states a number of options.

We disagree with the statement that a top down approach for OPEX is inconsistent with principles of a BU model. TD data is used in BU models (see the Swedish *hybrid* fixed model – which specifically used TD OPEX to ensure the BU model is accurate). This hybrid approach is often recommended as a best practice as it overcomes the inherently weak method of OPEX definitions in BU models (usually included as a

percentage the capital values – which is inaccurate unless the percentage is correctly calibrated to give the right actual total OPEX).

TD OPEX need not be weak if inefficient costs are excluded. This can be done and efficient OPEX is a reasonable starting assumption for a mobile operator in a competitive environment. This is contrasted with a fixed incumbent.

The BU OPEX approach defined by HAKOM (that defines tasks, and the time and costs to needed carry out the task) is a complex and inaccurate way to defined total OPEX for a complex mobile business. There are huge numbers of tasks in a telco, each with widely varying times and costs – the time variance on even one standard task can be large. This is not an appropriate method. It *can* be used for certain very specific network elements or services. Colocation services have some very detailed support service tasks, such as installing tie cables or accompanying visitors to a secure colo space. In this case the HAKOM approach is possible.

In general OPEX measures for the many diverse tasks needed to run a mobile network are best *not* attempted in the way indicated by HAKOM in Tables 2 & 3. In any event almost the only way to get the accurate average current cost for a task is a top down ABC (activity based cost allocation) method from the General Ledger. Inherently this is a TD cost model (staff costs are allocated to many tasks [activities] and then the average unit cost of the tasks are defined from the number of tasks carried out per year). We note in passing that equipment OPEX, and task OPEX are not directly available from the General Ledger or the published accounts: some ABC is required to define them.

HAKOM notes that OPEX is defined in many BU models as a percentage of capital costs. This is simply how the OPEX is processed in the model. An inaccurate reply is obtained from a request to vendors or operators with the question: what is the OPEX as a percentage of capital value for item X? This is not a measure that operators or equipment vendors normally consider. The percentage *can* be defined by ABC methods. This is a two stage process: allocate the OPEX to asset elements and then to ratio these values to the capital values of the elements to get the percentage. Most OPEX values defined as a percentage of capital values are in fact probably derived by this approach.

Taking a percentage OPEX value from another model is a false approach since:

- There is no certainty that the other BU model made solid OPEX measures in the first place.
- Was the OPEX efficiently derived from solid TD (or other⁹) data?
- Was the OPEX only an approximate value as the BU model did not require to be very robust?
- Was the OPEX defined for the same equipment?
- Was the OPEX defined for the same economies of scale?
- How can the OPEX be converted accurately to Croatian levels?
- How can a percentage be investigated – especially as the source is simply stated to be another BU model in another country? It might in turn be just copied from another BU model!
- If capital values alter, the OPEX costs in the real world do not alter – a simple percentage approach ignores this.

⁹ We note another possible approach in the following paragraphs

If OPEX levels are available from a robust ABC source and inefficient costs can be eliminated (or do not exist in the first place) then this is the best approach. *This* OPEX should be used to define the percentage values to use in the BU model.

HAKOM did not mention the “Functional Area” approach to BU OPEX modelling. A reasonable reply can be made to a question such as:

- “How many staff are needed to provide field repairs to 20,000 PSTN lines in an urban environment?” or
- How many staff are needed to repair and maintain 100 BTS masts in rural areas?”

Operators can do this from their own business data or obtain this from other countries’ business data. The actual staffing in the Croatian business of a different size can be estimated from this type of data. Salary and support costs can be added to get a full OPEX cost and then this can be allocated to the network elements (possibly it is then actually *included* as a percentage, but the net effect is to obtain the same allocated costs).

The functional area method is more accurate than a simple rule-of-thumb percentage method and is much more accurate than the task by task costing approach. However it is not as good as a solid base of efficient TD OPEX based on robust ABC. This ABC approach is recommended.

HAKOM is requested to confirm that TD efficient OPEX will be used to calibrate the BU OPEX.

Commentary on Question 4

“Do respondents agree with HAKOM’s preliminary view to implement both the required capacity and the Shapley-Shubik allocation methods for joint and common network costs in the bottom-up models? Please elaborate.

The issue of Shapley-Shubik has already been raised on our general commentary on the LRIC approach under question 2.

The HAKOM discourse notes that joint and common network costs have several options for allocation. Technical drivers and game theory (Shapley-Shubik), being the two proposed.

The technical approach suggests capacity as the prime driver. This is not the only parameter, though this is often a valid “proxy” cost driver. In some core systems, more capacity demands will ultimately drive the dimensions of the joint and common cost elements. There is a cost driver for most elements. Other capacity related drivers do exist – the numbers of fibres or numbers of cables (copper or fibre) drives the joint cost of duct. This is also true of core transmission that may be used by mobile networks. Similarly building costs are driven by equipment numbers so there is a valid cost driver proxy that may be used. In a long run cost view, it is clear that most services’ volumes when combined do drive these costs.

We understand that this ultimate cost driver logic is appreciated by HAKOM and the Shapley-Shubik method will help to ensure a sensible outcome and avoid the potentially unrealistic results that can result when using proxy cost drivers and only removing one service at a time, individually. The approach

described by HAKOM implies that all services are removed in multiple orders so a more truthful inclusion of the joint cost is ensured to each service (since we note that in the long run this cost does have a cost driver to services). HAKOM is requested to confirm this.

The proposed Shapley-Shubik method appears to also overcome some of the concerns of equipment modularity (see earlier comments on Question 2). HAKOM is requested to confirm this or to clarify how the BU model will not give anomalous incremental costs due to inclusion of modular equipment increases (or no increase in cost for the same reason).

We note "HAKOM intends to choose the required capacity approach as the allocation method in the bottom-up models for joint and common network costs, as this approach allocates such network costs in accordance with the capacity required by each service and thus conforms to the principle of cost-causation." This is a reasonable and sensible approach, and this is supported – it is in line with our comments above that there *is* a cost driver for most costs, even if they are joint. We noted above that there are various capacity drivers, depending on the nature of the cost. HAKOM is requested to identify the joint cost types and define the capacity cost drivers, for open comment by the industry.

A concern with the HAKOM approach is that it does not explain how the telecoms industry (especially Vipnet) can be sure that the Shapley-Shubik method is carried out correctly. This is most relevant if there are complex calculations that consider the combinatorial factors of many services sharing the same network – the calculations are then multiplied by the many time factors (i.e. more runs of the model for different years). HAKOM should specify how the model will function and how the industry can verify it has been done correctly.

No comments are made on copper/fibre access allocation.

Commentary on Question 7

"Do respondents agree with HAKOM's preliminary view to implement tilted annuities or adjusted tilted annuities in the bottom-up cost models?"

It is noted that BU models mostly use tilted annuities or a form of net present value (NPV) calculation that aim to give a proxy to economic depreciation. Tilted annuities are widely used to give an economically valid set of results. Some concerns with the HAKOM discourse are noted in the following.

HAKOM says there are two annuity approaches (tilted and adjusted tilted) to be used. It is not clear exactly how each or when each is to be used. This is a concern raised elsewhere on the consultation paper: there is a lack of clarity from HAKOM on what is going to be done, before the model is made. Best practice is to define the model methods (technical and economic) in advance before the model is structured.

We are not totally sure on how and where in the BU model the annuity methods are calculated, or which one is to be used for which assets.

HAKOM states:

"The main drawback of this [*adjusted tilted annuity*] depreciation method is that it requires forecasts on the number of outputs produced by an asset over a long period of time."

Does this mean that HAKOM intends to do calculations that require predicted volumes that cover the entire asset life? This approach then approaches the NPV method that identifies asset costs and volumes over all time (historic and future). The adjusted approach will then need to justify how future volume effects are included and effectively discounted (unit costs further into the future have less impact on the unit cost for prices set for today/next year).

Any model that is trying to model a business with rapidly changing volumes (such as mobile) will need to consider future volumes. It is not clear how HAKOM intends to do this. This is also true of a model that uses the more conventional tilted annuity approach. This conventional tilted annuity method would:

- Define the unit cost of services in 2011, using the tilted annuity function¹⁰
- Repeat the above method using increased volumes and the resulting altered network asset base, plus using the prices for 2012, then again for 2013 etc.

This provides the unit cost of services in each year. For a business with rapidly rising volumes the unit cost might be high in 2010/11. The unit costs in each year (including 2012/13/14 etc) can be weighted to get an average price. An economically valid method is to weight by the volumes, discounted by the WACC. This is a type of discounted cash flow method: as would be done by investors. This also supports the yearly approach mentioned in Question 14.

Ovum does not claim that this method must be used, but it serves to emphasise the issue that we do not have clarity on the approach that HAKOM will employ. Any method chosen should consider:

- Ensuring that the resulting unit costs for past years calibrates to real past unit costs (as seen from an efficient TD CCA model). In this case the TD values should correlate closely to the full LRIC or LRIC+ values of the BU model
- Future unit costs must be considered, along with current costs when setting prices, as unit costs fall, but the benefit of the lower unit costs in, say, 2014 are not obtained today. Clearly a discounting approach is effectively required in the economic calculations.

The approach must consider the impact of rapidly rising volumes. This is shown by an extreme example. If an operator only started in 2010, then unit costs in 2010 and 2011 will be very high and prices will be loss making. As unit costs fall in the future, the overall business should become NPV positive even with prices that only change slightly over time. If the cost model sets prices that are cost-based for 2012 onwards, then the (normal) losses in the business plan's early years of 2010 and 2011 will not be compensated for: the overall business is NPV negative. For this reason some models have to consider historic costs as well as future costs, even though price setting is fundamentally a forward looking process¹¹.

It is requested that HAKOM clarifies exactly which approach will be used, and where in the BU model and how it is done as part of an overall approach that considers the effect of time and volume changes. The HAKOM approach should clarify how it will ensure an overall positive NPV in mobile businesses that have rapidly rising volumes.

¹⁰ The tilted annuity approach is used, for example, in the PTS Sweden fixed network model. This is used annually and asset prices “advanced” yearly. The regulated prices are regularly updated so that the model is not run for multiple years far into the future, plus the model is for the fixed network, so the traffic volume changes are not dramatic (this is in contrast to many mobiles)

¹¹ Past investments *do* impact forward looking decisions if the past costs are not yet recovered

It is requested that HAKOM clarifies how the price trends will be defined and how Vipnet will be involved in defining the correct values. Vipnet also requires that the volumes be based on realistic data and this may be obtained from Vipnet – industry involvement is a requirement.

Commentary on Question 8

“Do respondents agree with HAKOM’s view that economic asset lives should be used in bottom-up models?”

It is generally agreed that economic (actual lives) provide a better basis for pricing decisions than using accounting data. Accounting lives are set for specific purposes of annual reports and to agree with accounting standards. Economic costing should be based on proxies that simulate real future discounted cash flows: this is defined by realistic lifetimes.

The main issue is: how these lives are to be defined. Vipnet believes the lives must reflect the realistic lives that Croatian operators have and will experience. Engineering evidence may be provided by Vipnet on the actual (realistic) lives of Croatian assets¹². HAKOM should confirm that it will accept this evidence.

It is noted that some assets have uncertain lifetimes – perhaps no data exists for a recent asset. HAKOM has not clarified how such an economic life will be determined. In the absence of any solid data to the contrary, accounting lives may be considered. Short lifetime assets or those with minimal capital values are also commonly analysed using accounting lives (as any difference to the net economic cost is likely to be small). HAKOM is requested to clarify the approaches to be used.

Commentary on Questions 9 and 10

“Question 9 Do respondents agree with HAKOM’s preliminary view to exclude the working capital which is not related to the network activities or the provision of services?”

“Question 10: Do respondents agree with the HAKOM’s preliminary view that, except for working capital generated by CAPEX which should be taken into account through depreciation formulas, the cost of working capital related to network OPEX should be excluded from the cost model?”

The HAKOM discourse on working capital (WC) describes the general nature of WC. HAKOM suggests that the WC levels are zero, or close to this level and so may be discounted. HAKOM also noted the need to have working capital to run a business in order to pay salaries and vendors. This means that cash is required to be available to serve this liability. WC should be considered net of current assets such as payments that are due.

¹² This can be due to technology refresh, optimising OPEX, lower emission (green factors) etc

The LRIC process aims to define the cost of wholesale services that are supplied to other network providers. In effect this is defining the cost of running the wholesale network business. In the case of a mobile, there is no need to actually separate the accounts into a retail and wholesale business: in contrast this commonly done in fixed businesses. Accounting Separation (AS) is not required. With this AS logic in mind, the approach described by HAKOM seems to mix up retail revenues and wholesale costs and revenues. An overall business might have very low WC levels – in particular when retail revenues are taken in advance and vendors are paid in arrears. However for wholesale services, the network business should be considered and the concept of AS is relevant for the definition of wholesale service costs. In this case there are current liabilities of salaries that are due, and the current assets of wholesale payments from other operators that are paid in arrears. It is common when wholesale internal transfers are made, that it is assumed that the Retail business also pays its own Wholesale business in arrears. This is the approach used in the BT Regulatory accounts. The logic is that downstream retail businesses behave in the same way as other operators. This non-discrimination principle has a logic (and this is used by BT and Ofcom). Internal current assets (in Wholesale) nets to zero across the whole business as the same amount is a current liability to the retail business.

We do not propose that AS is required for a mobile business (this is very rarely done), yet the conceptual structure helps to show that WC is relevant when defining wholesale service costs (and prices).

This internal and external payment scheme has not been fully considered by HAKOM. Of course the level of WC should be an efficient level. A start point is the need to have enough WC to pay salaries due by the end of the month. There are staff and vendors that need to be paid, so some WC is relevant.

This review does not attempt to define the efficient WC for a mobile network business. It is proposed that this is greater than zero, and considering the WC for the whole business (retail and network) as one unit can give a distorted view. HAKOM is requested to review its approach and consider these issues. Vipnet may be able to help HAKOM define efficient working capital levels for a notional network (wholesale) business based on debtor and creditor days etc. or other data on OPEX and vendor payments. The final approach and data that is submitted will depend on clarity of the final HAKOM approach to defining the efficient WC levels.

Commentary on Question 14

“Do respondents agree with HAKOM’s preliminary view on proposed ‘yearly approach’ to network dimensioning?”

HAKOM describes the general issues and alternatives. The chosen approach is stated to be the yearly method as telecoms normally has increasing volumes. There is a logic to this but there are some issues that should be considered as certain historic cost structures remain relevant.

The first assumption is that volumes are rising. This is often true but there are a number of exceptions to this. Access line numbers in fixed networks often fall, either due to fixed to mobile substitution or movements to broadband and VoIP. Falling fixed line voice traffic levels are also observed in a number of countries. This can be correctly factored in to a BU model by having historic data: the network has to be dimensioned for the traffic seen last year (or the year before). This efficiently-incurred cost still exists today, even if the assets are less fully utilised. Just because they are less used, the cost does not

disappear. Versions of the Swedish BU fixed model have considered this. The effect of falling volumes has resulted in increases in the cost of termination in some countries.

The scorched node principle should be followed. Historic designs and equipment volumes are a reality and so the costs should reflect this. Unless there are gross inefficiencies, the past numbers are a reasonable basis for asset calculations. This is of course a lesser issue for mobiles as the asset base and nodes are assumed to be efficiently incurred, plus volumes are mostly rising.

It is possible that assumptions of rising volumes, even in mobile, may not be correct. SMS services may be rapidly superseded by instant messaging over internet-based services, voice could be arbitrated by VoIP using data services. The voice and SMS equipment are real investments and even if no longer as fully utilised, they need to have their costs recovered. Assets cannot shrink. An alternative would be to define some assets with a much shorter average lifetime, meaning that the assets are written off as the volumes contract (the annualised cost is then higher). This requires a model that is set up with a degree of *a priori* knowledge of the future volume trends several years out into the future. This is noted to be difficult: telecoms has a number of disruptive services and technical changes that are hard to predict. The history of telecoms is littered with businesses (often now bankrupt) that failed to predict the future. The HAKOM approach should not be over-reliant on predictions.

HAKOM states that the model will use a yearly optimisation. This has a number of concerns:

- It is not reasonable to revise a network every year to a new optimum without some consideration of history and scorched node type logic. This is shown by a simple (fictional) example. An efficient network technology for 2011 may be based on a router that uses SDH optical interfaces. This equipment may have been set up over the previous 3 years and is state of the art. The expert view at the time was that the assets will have 5 year lifetimes. In 2012 a totally new all-IP router system with new interfaces could be used. Fewer items and lower costs may be required. The 2011 investments will not have been recovered. A new optimal network for 2012 will not have allowed the past assets to be recovered. An operator cannot be expected to have a totally re-optimised network without ensuring the optimal network of the previous year has recovered. The costs of migration have also not been considered in this example (but they are real).
- If traffic were to drop to 10% of last year's levels, then a new optimised network, for the new year would not be possible in any real business.
- The cost of coverage might be considered as a cost that is not traffic dependent. This point was raised earlier in this Ovum annex. It is nonsensical to continually change this cost over time as it would create a constantly changing view of what the investment actually required to get started (an initial network with no traffic).

The above points are separate to issues of inefficient network designs and inefficient technology choices (which are more of an issue for fixed networks). In this case, old technology assets should be replaced by the modern equivalent asset in many cases, as the alternative technology has been known to be more optimum for a long time. The fact that the old asset and technology may remain physically in place (because it still works) would not mean that the inefficient operator should be allowed to recover that cost – the cost should be based on the optimal modern equipment.