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Dok. ansvarlig: CHB
Sekretær:
Sagsnr: s2020-548
Doknr: d2020-9148-11.0
9. juni 2020

Second draft LRAIC model - comments by Dansk Energi

Dansk Energi (DE) appreciates the invitation from the Danish Business Authority (DBA) to comment on the second draft LRAIC model for fixed networks. All model references in DE's hearing response is related to the public Norlys model.

Our contribution consists of the following two parts:
Part 1: Comments on second draft model
Part 2: Consultation questions (Q20-Q28)

Part 1: Comments on second draft model

Efficiency adjustment

DBA performs an efficiency adjustment in the Norlys model. DBA investigated TDC in Norlys' coverage area. According to DBA the investigation showed that TDC got 450 CO's in the Norlys coverage area, compared to Norlys' 392 CO's. The analyses showed that for 37 rural CO's the Norlys ratio of trenches per home passed was 15 pct. higher than TDC's ratio. The performed efficiency adjustment adds CO's to the Norlys model, to be able to reduce the trenching with 15 pct.

DE is convinced, that there is no legal basis for the performed efficiency adjustment.

The MRP states that:

DBA interprets the Scorched Node constraint such that when modelling an "optimally structured network" under the scorched node assumption the locations for equipment are constrained by the existing number of sites and their existing locations. However, the scorched node assumption does not imply that the transport network - cables, duct/trench etc. - is fixed. Nor does the assumption imply that the same number and type of equipment should be placed at each of these geographical locations.

Supporting criterion 26: The LRAIC model should show the costs of a network with an efficient configuration operated by an efficient company, based on the latest proven technological solutions and an optimally structured organisation. However, the starting point should be the existing geographic network architecture in the modelled operator's network. This implies that equipment should be placed at the existing geographical locations of the modelled operator's network nodes (the scorched node assumption).

i) DE's primary claim is, that the adjustment conflicts with the scorched node assumption. The scorched node assumption implies that the optimization in the model are constrained *by the existing number of sites and their existing locations.* DE does not agree that extra nodes can be added as suggested by DBA.

ii) DE's secondary claim is that even if it was allowed to add network nodes under the scorched node assumption, the DBA method is in conflict with the scorched node assumption. DBA's methods ignore the *existing location* of the existing nodes in Norlys, as the adjustments distance calculation is based on a distance calculation based on TDC's CO locations.

iii) DE's third claim is that, if it is allowed to add network nodes under the scorched node assumption, the adjustment calculation has to be done based on a thorough calculation, and not just a quick and dirty percentage adjustment. The model which are being developed is based on very precise information's about location of nodes, roads, customers etc. An efficiency adjustment should not compromise the model's accuracy. As far as DE is informed, Norlys delivered addresses for each of the CO nodes. If DBA think they can improve the efficiency in the Norlys model by adding more CO's, the added CO's shall be added with an exact address (location). And then when all new CO's are added, with their corresponding addresses, the R-model should be re-calculated, to show the improved results regarding distance dependent assets. In this way, the model will fulfil the scorched node assumptions about taking the nodes existing location into consideration, as the R-model will calculate distances from the original Norlys CO addresses to end-users in those CO areas.

iv) DE's forth claim is that the DBA method of using TDC results compromise the transparency in the model. The fibre operator (Norlys) does not have access to information about TDC site locations, this results in a black box calculation, where the fibre operator doesn't have any possibility to check the performed TDC calculations in the R-model. The lack of transparency can be decreased, if the efficiency calculation is done by adding CO's, with their addresses, in the R-model, as described above. This method will make it possible for the fibre operator to check the R-model results, and see which areas will be covered by the new CO. Furthermore, this calculation will result in a real efficiency adjustment (if any), as the model will show the exact improvement in the fibre operators LRAIC results.

Besides the non-existing legal basis for the efficiency adjustment, DE has some comments to the model implementation of the efficiency adjustment:

i) DE want to question if DBA really believe that CO locations optimized for a copper network is more efficient than the fibre operators' locations optimized for fibre so-

lutions. The copper networks are based on a limit of about 5 km, while one of the advantages of fibre is that fibre can do much longer distances. The benefit is that the number of CO's can be reduced in fibre access network, and thereby reduced OPEX.

ii) DE is convinced, that the 15-pct. cost reduction claimed by DBA must be due to incorrect calculations. Is the difference at 15 pct. based on the different method used for TDC, where closest/cheapest customers are covered first, while the Norlys calculation is based on actual addresses?

iii) The implemented adjustment factor not only lowers the trenching distance in the access network, it also lowers the trenching distance in the backbone network. If adding more CO's, there will be a need to connect those to the backbone network, i.e. trenching in the backbone network should increase when adding nodes.

iv) Adding more CO's will reduce the utilization factor on the existing CO. This has not been considered in the model implementation of the efficiency adjustment

v) Adding more CO's will increase power consumption, that is not implemented in the model.

vi) The number of CO's in the model does not change when the efficiency factor is changed (1C, cell E310). It remains 342.

vii) The number of CO's in the model (342) is lower than the number of Norlys CO's (392). This number should be 392, or higher if CO's are added during the efficiency adjustment.

WACC risk premium

Telia & Telenor (TT) states that there is no clear evidence that deployment of new fibre infrastructure networks bear more risk than operating a copper network why the justifications for a risk premium for fibre networks deployment no longer appear to exist.

Dansk Energi do not agree with TT.

In August 2017, DBA completed a review of all aspects of the Weighted Average Costs of Capital (WACC) with attention on supporting investment incentives and securing a stable and transparent investment environment for market participants[1].

DBA's review included a risk analysis of all infrastructure technologies i.e. fibre, copper, coax and mobile networks. DBA concluded that the deployment of new fibre infrastructure is exposed to asymmetrical risk primarily caused by a limited utilization of the fibre deployment (investments) - due to a lack of demand from the consumer side when comparing the fibre footprint (homes passed - HP) with the uptake of customers (homes active - HA).

[1] https://erhvervsstyrelsen.dk/revidering-af-principperne-erhvervsstyrelsens-wacc-beregning

DE believes that this is still the case. Today, the average number of HA during new fibre roll-outs varies between 15 and 40 pct. of HP's creating a long tail of potential delayed installations and a continued uncertainty in terms of demand and market dynamics.

The market uncertainty has been reinforced by the newly upgrade of coax to gigabit speeds (Docsis 3.1) and a rising number of fibre projects including deployment of two competing fibre access networks (TDC / fibre-utility).

DBA concluded in the WACC-review that the previous set of risk premium of 1 pct. on fibre networks was based on an underestimated assessment of market uncertainty - taking the continued span between fibre coverage and uptake of customers into consideration. DBA therefore imposed a risk premium of 2 pct. on fibre networks (not including the DONG area).

DE finds that the conditions for the WACC risk premium remain unchanged. The WACC risk premium is of significant importance to secure already held investments in fibre networks as well as securing the necessary incentives for continued investments in fibre networks - which also is one of the key objectives of the EECC.

However, DE do not believe that a discussion of the WACC risk premium should be part of the current consultation on the LRAIC model for fixed networks.

Boundary of the access network

The boundary for the access network in the model is at the outside of the buildings wall. The model suggests, that drilling the cable through the wall, and installation of the NTP inside the house, shall be priced as an ancillary service, and paid by the first service provider with an active customer at the specific address.

First of all, DE wants to stress that the entire drop wire installation is made in one workflow, including NTP. The fibre drop line cannot in practise be established unfinished outside the house waiting for the first customer to order an active connection.

FBSA requires that the NTP is placed in the inside of the building (household). The Ethernet outputs (RJ45) on the media converter – providing network termination for service providers, but no other functionality like routing, switching and WiFi – is in general considered the optimal network termination point in wholesale agreements between fibre network operators and service providers. The solution keeps the costs of end-user installations down for both network operator and service providers:

a) the network operator can make use of cost optimization, including scale.

b) the service provider will only need to install end-user equipment that does not have complex SFP (fibre) modules etc. which would increase the costs. Service providers are also able to reuse their equipment when customers churn (equipment can be sent back and forth between different customers, because the installation can be done by the customer themselves).

Therefore, DE suggest changing the boundary of the access network, so that drilling through the outer wall and mounting of NTP is included in the FBSA cost calculation. The installation (drilling and NTP) will last for several years, so DE find it reasonable to depreciate those assets as well, instead of treating them as one-off fees.

One of DE's members will on a confidential basis provide DBA with cost information related to drilling, NTP and installation – as an appendix to the DE hearing response. The cost information will be sent directly to DBA from the member company.

Use of historical WACCs

Historic WACC values was subject for discussion in the hearing responses for the 1st draft model. Among others, it was DE's view, that historic WACC values should be implemented in the model to mimic the financial circumstances under which the historic investments were made. Unfortunately, DBA refused to change their view on this issue. DE urge DBA to reconsider their opinion on this subject.

At the workshop held August 14, 2019 it was explained that the model would ensure cost recovery for the modelled operator, during the lifetime of the network.

In EU's recommendation of September 11, 2013 (2013/466/EU), it is written that:

"Cost recovery is a key principle in a costing methodology. It ensures that operators can cover costs that are efficiently incurred and receive an appropriate return on invested capital."

At the workshop held in Maj 2020, Axon explained that, if the actual used WACC is lower than the average WACC in the modelled lifetime, then the operator will not achieve cost recovery.

The actual WACC level is at a historical low level. As pointed out by TDC in their first draft hearing response, the WACC has decreased since 2005, which is the starting point for the modelled network. Using the historical low 2020 WACC for all years, it is likely that it will be lower than the average WACC during the modelling period. The average WACC 2005 to 2019 was 6,5 pct., i.e. 2 pct. point higher than the actual level. By deliberately disregarding historical facts, it is unlikely that the modelled operator will be able to achieve cost recovery.

It is still DE's view, that the historic WACC values should be implemented in the model to mimic the financial circumstances under which the historic investments were made.

Delayed installations

DE is pleased to see, that DBA has altered the model to include a functionality to model delayed drop cable installations.

Delayed drop cable installations have a higher cost than immediate installations done during the fibre roll out in the area. In DE's hearing response to the first draft model, DE (Fibia) listed the extra cost related to delayed installation. The tasks that cause extra cost was listed as:

• Design of a single drop wire in GIS system will be more time consuming per wire, compared to the main roll-out.

• Administration and processing the application for the trenching permission from public authorities.

• External contractor costs for the execution of one customer drop wire, will include extra transport of machinery and workers.

• Extra cost for the installation of one NTP (extra transport costs).

• Final documentation of the drop wire in GIS-system.

The cost driver for these extra costs is the number of delayed installations. This means, that an extra cost of X DKK should be added on top of the cost for immediate installations. The extra cost should be added as a “set-up cost” for each delayed installation.

The model uses the distance as cost driver, on both immediate and delayed installation, with a higher cost for delayed installations. But as the cost driver for the extra cost related to delayed installations is the number of delayed installations, DE believes that the distance related costs should be equal for the two types of installations, and the extra cost of X DKK should be added on top of the distance related cost, per delayed installation.

As DE understand the model, it only adds delayed installations, if the number of immediate drop cables installed is less than the demand. By default, the model is set to model drop cables to 40 pct. of the households during roll out. But already the first year after rollout, some of the remaining 60 pct. homes passed households can order a broadband connection. This means that delayed installations will be made from the models’ year one. The model must be changed to reflect this fact.

The number of delayed installations will increase over time, as the amount of homes passed increases. When the operators have finished their roll out, all new installations will be “delayed installations”. Fibia has made an illustration showing the number of delayed installations so far. Furthermore, the illustration shows Fibias estimates regarding delayed installations in the future. Fibias illustration will be send to DBA as supplement to DE’s hearing response. Unfortunately, we cannot comment on Fibias exact figures in this hearing response, as they are confidential. But the illustration shows that delayed installation is a considerable proportion of all installations.

<u>Incentives for continued technological innovation, PtP-PON</u>

In the mid-00´s, when the Danish energy companies decided to deploy fibre networks, PtP was the mainstream technology and solution – not at least in Northern Europe.

Over the years, continued specifications of PON have provided increased bandwidth and improved service support capabilities (GPON, XG-PON, NG-PON2, XGS-PON). Today, PON is the preferred technology worldwide, including Asia, Europe and the Americas.

DE finds it crucial that the LRAIC modeling and DBA's subsequent use of the modeling provide incentives for fibre operators to continue technological innovation, including a partially or fully swap from PtP to PON (PON over PtP).

Further, as it is a main principle for the development of the model that the operators will receive coverage for their costs the extra costs associated with change of technology during the lifecycle of the fibre product should be taken into consideration.

Two of DE's members will on a confidential basis provide DBA with a description of their fibre networks including a partially og fully conversion from PtP to PON. The information will be sent directly to DBA from the member companies.

Co-digging

During DBA's workshop on 14 May 2020 Telia wrongly implied that the electricity distribution system operator (DSO) cover most of the digging costs when they co-dig with the fibre-utility operator.

The Danish DSO's are subject to strict monopoly regulation securing waterproof shields to all other activities, including commercial fibre deployment. Agreements on co-digging with other participants, including fibre-utilities, are based on full transparency - participants pay their respective share of the digging-costs - based on agreed market terms and prices.

The Danish Utility Regulator (DUR) has previously carried out a thorough investigation of DSO's co-digging agreements with internal/external fibre participants. DUR concluded, that the cost-sharing agreements was in full compliance with the monopoly regulation of DSO's[2].

Co-digging does not necessarily lead to lower digging costs for fibre deployment. In fact, many fibre operators have experienced that co-digging with DSO's (and others) has led to higher digging costs than if they carried out the digging by themselves (solo-digging) – due to a number of reasons, including a more complex process of planning and timing, which often leads to a general slowdown of fibre deployment. Co-digging with DSO's also requires wider and deeper trenches due to electricity network safety regulation demanding higher minimum distance to other cables.

Access conditions to building sites

Global Connect implied at DBA's workshop on 14 May 2020 that fibre-utilities can use the DSO's agreements with landowners (municipalities, farm-owners etc.) to get better rental agreements for fibre installments, e.g. central offices and fibre cabinets, than other telcos.

Dansk Energi do not agree with Global Connect.

[2] https://forsyningstilsynet.dk/media/2713/fordeling-af-graveomkostninger-ved-samgravning-4-0720-0200-0094.pdf

The Danish DSO's are subject to strict monopoly regulation securing waterproof shields to all other activities, including commercial fibre deployment. DSO's rental agreements with land-owners include only electricity distribution installments e.g. power substations. Furthermore, there are strict security requirements for access to locations controlled by the DSO's due to the danger of high voltage.

Part 2: Consultation questions (Q20-Q28)

Question 20: Do you agree, at a high level, with the inputs included in the Excel model?

Most inputs look reasonable at a high level, but as many prices are anonymized it is difficult to comments on these. As DBA knows from the answers to the data requests, the fibre operators face different prices on equipment, so the input evaluation will have to be done for each single operator, at the point of time they are modelled (if they are modelled).

The anonymized cost level for sites seems very low. Especially regarding Distribution and Core sites. The fibre models anonymized price for Distribution sites including power and cooling is 0,5 MDKK, respective 0,7 MDKK for Core sites. DE also noticed that the cost level for Distribution and Core sites is much higher in the TDC model, where the anonymized cost level for Distribution sites is 42 MDKK, and 58 MDKK for Core sites. DE acknowledge that TDC operates larger sites than the fibre operators, but that cannot explain the entire difference in cost. DE urge DBA to investigate the fibre operators' site costs and adjust the site cost in the fibre model.

Question 21: Do you agree with the methodology followed for the treatment of non-network overheads in the Excel model?

DE does not agree with the methodology for the treatment of non-network overheads. As DE understand, both TDC and Norlys supplied DBA with figures only related to wholesale. And in that case the "new" method for allocation overhead is wrong, as no overhead should be allocated to retail.

DE recommend using the methodology from 1st draft model, combined with overhead figures that are network/wholesale related.

Question 22: Do you agree with the consideration and implementation of an efficiency adjustment to account for potential inefficiencies in the deployment of access networks?

Please see our comments on page 1 regarding Efficiency adjustment.

Question 23: Do you agree with the access and transmission network dimensioning algorithms implemented in the Excel model?

First, DE would like to state, that some algorithms are difficult to trace. So, there is a risk of undiscovered errors.

Be aware that the Excel Model Manual have a typing error in exhibit 5.24. The formula for the calculation of the km of horizontal drop cable should be changed to with regard of the nonoptimal length adjustment. It shall be "+" not "-", i.e. …(1 + % of nonoptimal length)….

Please see DE's comments about the delayed drop wire elsewhere in this hearing response.

Question 24: Do you agree with the dimensioning algorithms/scripts implemented in the R model?

DE has not been able to perform a thorough review of the R model. Errors that may be found in the R model must be corrected in all R model versions, i.e. if errors are found in the TDC R model, they should be corrected in the fibre operator R model as well, and visa versa.

Question 25: Do you agree with the routing factors matrix defined in the Excel model?

DE has not found any errors in the routing factor matrix.

Question 26: Do you agree with the results of the wholesale access services produced by the Excel model?

DE does not agree in the results of the wholesale access services. Some of the criticisms mentioned in this hearing response affect the results. DE believes that these issues will have to be changed before we agree in the results of the model.

Question 27: Do you agree with the results of the wholesale bitstream services produced by the Excel model?

The issues raised by DE will have to be dealt with, before we agree with the model results.

Question 28: Do you agree with the results obtained for the ancillary services?

In the hearing report DBA has written, that a detailed description of these services will be issued before or in time for the 3rd consultation. DE appreciate that DBA will make this description. Many of these services are new wholesale products for DE's members, so we are not able to comment on the ancillary services before we know the detailed description of each single service.

Med venlig hilsen

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