A DISTRIBUTED CLOUD & RADIO PLATFORM FOR 5G NEUTRAL HOSTS

Business Questionnaire - MWC 2019

Result Analysis

inCITES Consulting

March 2019

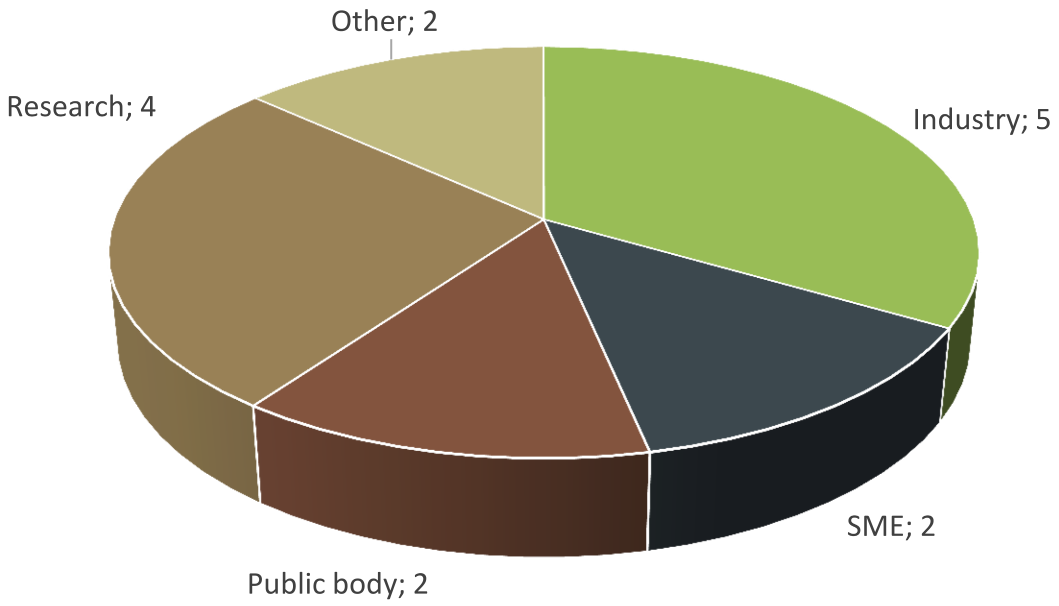
Key Takeaways

- *73% of respondents knew at least some details regarding the NH before responding to the questionnaire, which adds to the robustness of the results, despite the small number of respondents (N=15).*
- *The ability to request resources dynamically, ensuring SLA monitoring and compliance and the seamless interoperability of all systems are the top-3 most important aspects for an operator to employ the NH model.*
- *The lowest-ranked considerations in employing the NH model are sharing traffic and data characteristics and sharing information about the profiles of their customers.*
- *More respondents believe that the NH and not the operators should be the owners of spectrum, in contrast to the current model in which operators are the sole owners of the allocated spectrum resources and are subject to strict regulation for its use*
- *The majority of respondents believe that the NH model will result in 10-20% cost savings for the operators both on the CAPEX and OPEX side.*
- *Respondents believe that municipalities are not very technically capable (Score: 3.2/10) to undertake the role of the NH.*
- *73% of respondents believe that the NH services/products should be regulated, likely due to the need for a level playing field should exist for all telecommunication service providers.*
- *Over 50% of respondents believe that the billing relationship between the NH and operators should be based on the resources used from the latter.*
- *Respondents believe that reduced complexity would be the main reason why operators would be more keen to employ the NH model over the Operator Joint Deployment model.*

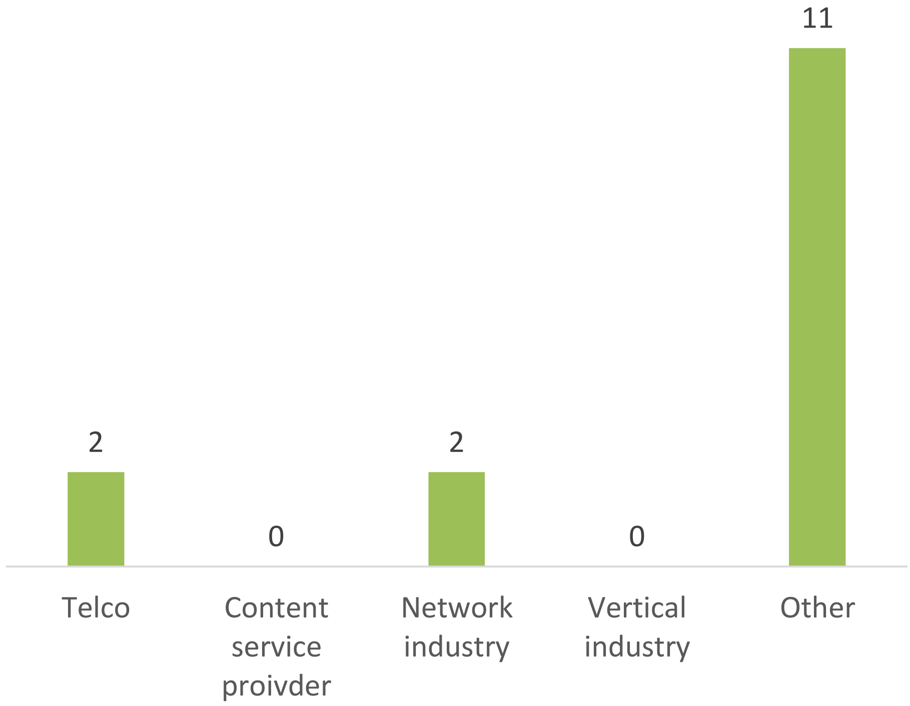
Sample Stats

The purpose of this questionnaire is to gauge how industry experts outside the 5GCity consortium view the implementation and viability of the NH model. We have received 15 full questionnaire responses. Although not a statistically significant number to draw robust conclusions about the NH model, all respondents come from the wider ICT sector, hence, we can assume they have a general understanding of the challenges and opportunities it presents.

Respondents' profile

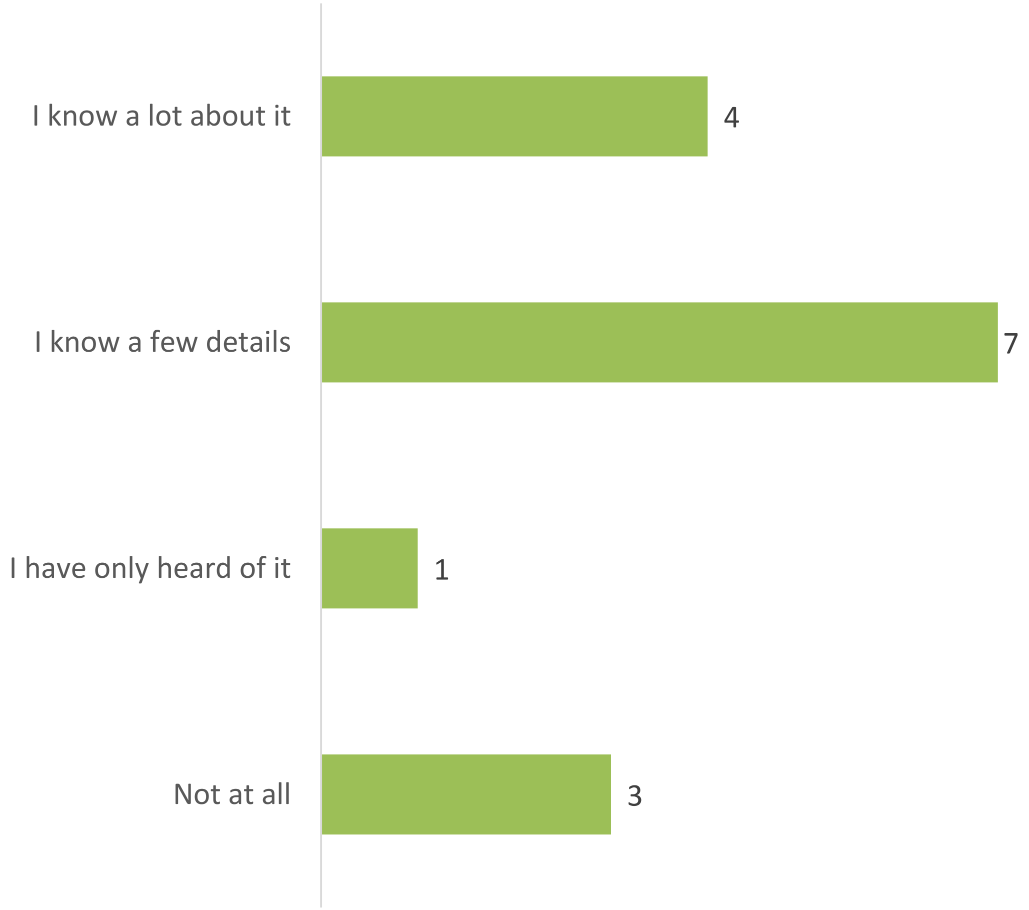


Organisation sector



Awareness about the NH model

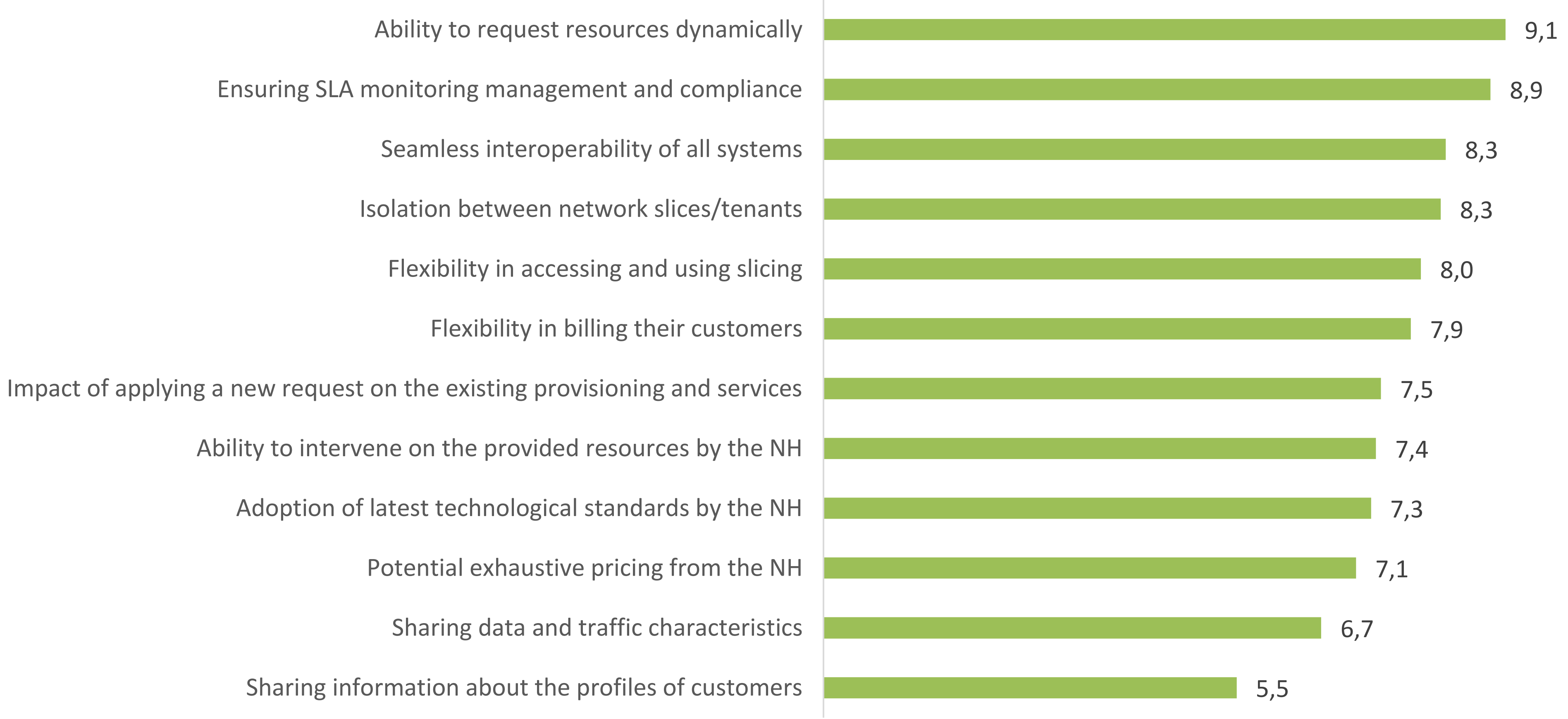
Q1: How familiar are you with the Neutral Host service platform?



- *11 out of the 15 respondents know at least a few details about the NH model. This adds to the robustness of the results.*
- *Those respondents who were not knowledgeable about the NH model, were informed by the 5GCity project experts about the general properties and business case of it before continuing to the following questions of the survey.*
- *Some respondents made us aware that they were familiar with the concept of the NH but under a different name, such as 'Shared Network', 'Common Network', 'Multi-Operator Network'.*

Operators’ considerations 1

Q2: How important are the following aspects in a Neutral Host service platform? Score between 1-10 with 10 being very important.



Average scores of the 15 questionnaires

Operators' considerations 2

Q2: How important are the following aspects in a Neutral Host service platform? Score between 1-10 with 10 being very important.

- *The respondents believe that being able to request resources dynamically and ensuring the seamless interoperability of all systems are the No. 1 and 3 most important aspects for the NH model. Both of these criteria relate to the ease of using the NH model from the operator's perspective, without any service interruptions that would compromise the QoS for the end customers.*

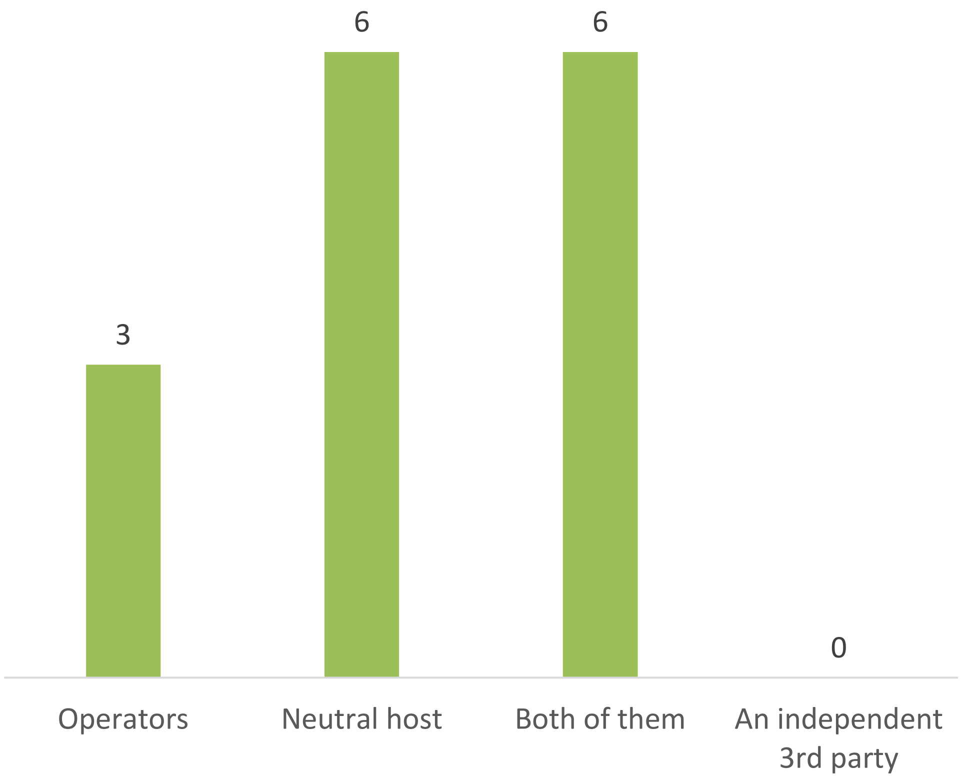
- *Ensuring SLA monitoring management and compliance is the second most important criterion for the survey respondents. This is likely due to the limited trust that operators currently have on the technical, business and operational characteristics of the NH model.*

- *The respondents do not believe that the potential for exhaustive pricing from the NH is a very important criterion. This is likely due to expectations that the operators will decide not to use the NH model in case their margins are squeezed significantly. Another likely explanation is that the respondents might expect that the regulator will ensure that the NH's rate card will be competition-conducive and fair.*

- *The lowest-ranked criteria are sharing traffic and data characteristics and sharing information about the profiles of their customers. These results are surprising given that the data that goes through the operators' network, for which they want to ensure they remain the proprietary 'owners', is very sensitive and there is high value in keeping it.*

Spectrum ownership

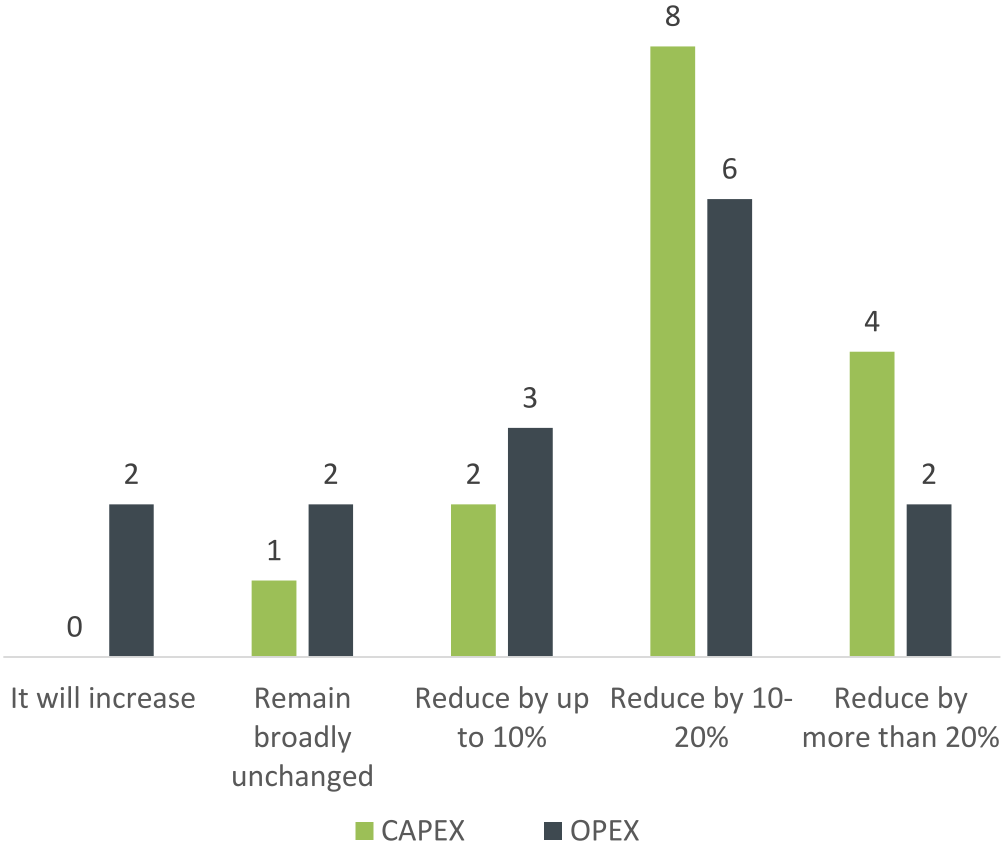
Q3: Who should be the spectrum owner among the various players in this ecosystem?



- *Surprisingly, more respondents believe that the NH should be the spectrum owner, in contrast to the current model in which operators are the sole owners of the allocated spectrum resources and are subject to strict regulation for its use. This is likely due to expectations that there would be less complexity in the process, should the NH own spectrum.*
- *None of the respondents believes that an independent 3rd party should be in charge of acquiring and allocating the spectrum according to the industry needs. This is likely due to the potential over-complication of the relationships between the ecosystem players, should a 3rd party be the sole spectrum owner.*
- *40% respondents believe that both parties should own spectrum. This is likely due to expectations that advanced spectrum management techniques can accommodate such an approach.*

CAPEX/OPEX

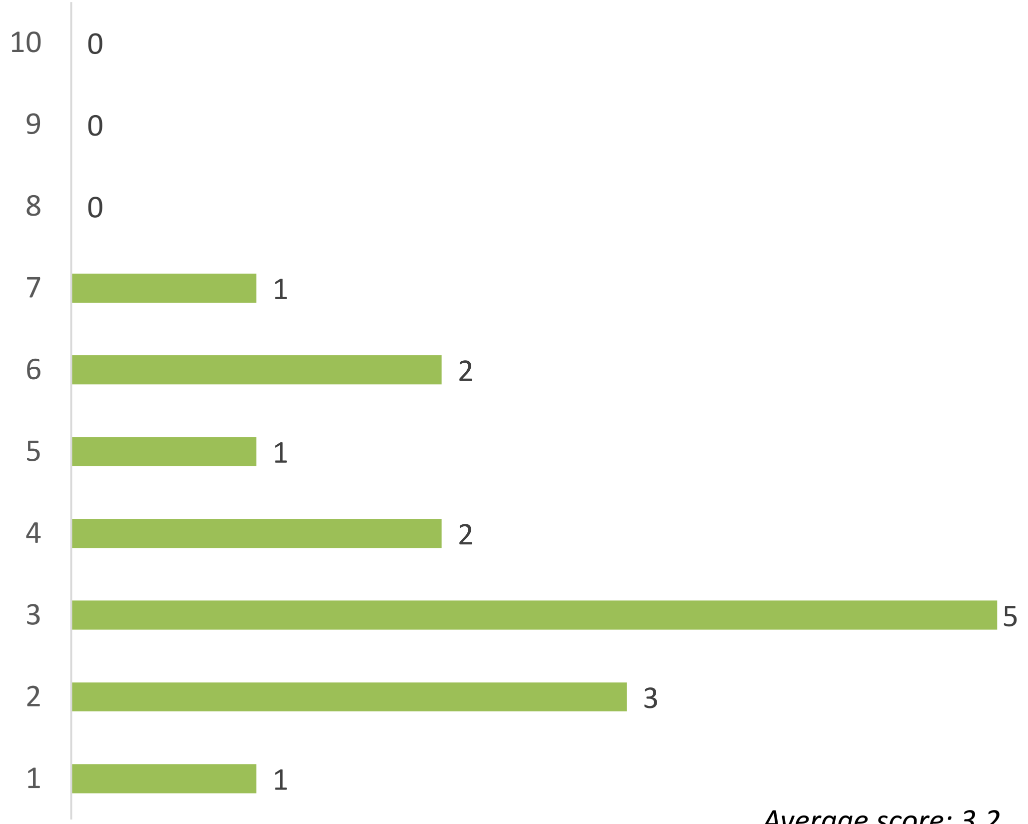
Q4: How much will operators' CAPEX/OPEX change by using the Neutral Host model?



- *The majority of respondents believe that the NH model will result in cost savings for the operators both on the CAPEX and (less so) on the OPEX side. This is in-line with the very principle of the existence of the NH model.*
- *2 out of 15 respondents believe that OPEX will actually increase for the operators by employing the NH model, likely due to additional experts that will be needed to manage the network.*
- *The most popular reply for both the CAPEX and OPEX is that operators could save between 10-20% by employing the NH model, while respondents are more confident about the cost savings on the CAPEX side.*

Municipalities as Neutral Hosts

Q6: How technically capable are Local Governments/Municipalities to undertake the role of the NH? Score between 1-10 with 10 being very technically capable.

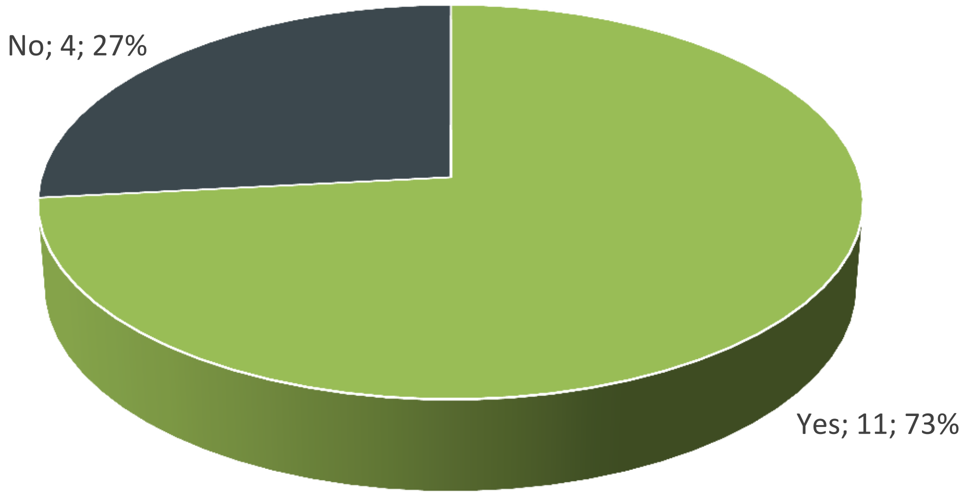


Average score: 3.2

- *Respondents believe that municipalities are not very technically capable to undertake the role of the NH themselves. This finding is not a surprise as providing connectivity services to citizens is not their primary responsibility.*
- *However, municipalities have the capacity to employ a third party to deploy and operate the NH platform.*
- *Potential players that could act as NH on behalf of the operators are equipment vendors or infrastructure owning companies.*

NH and Regulation

Q7: Should the Neutral Host services/products be regulated?

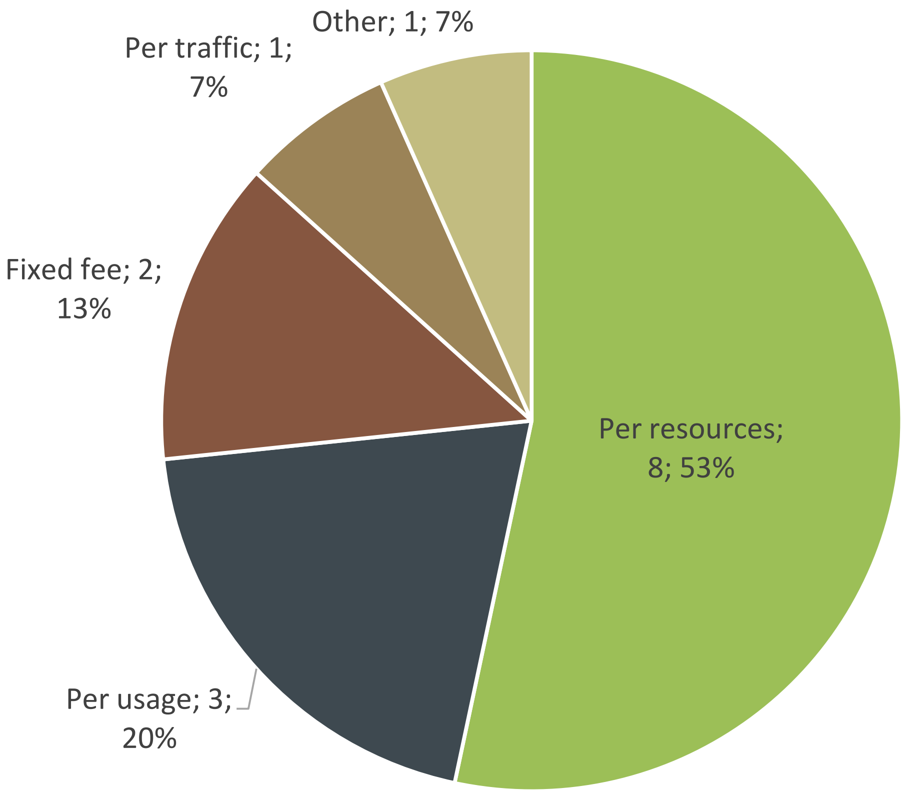


- *73% of respondents believe that the NH services/products should be regulated. This likely relates to the potential exhaustive pricing and potential preferential treatment of the wholesale customers that the NH would have in case its products/services were not regulated.*

- *Should the NH products/services be regulated, this would enabled fair and equal treatment of all actors requesting access, stimulating healthy competition in the market.*

Billing

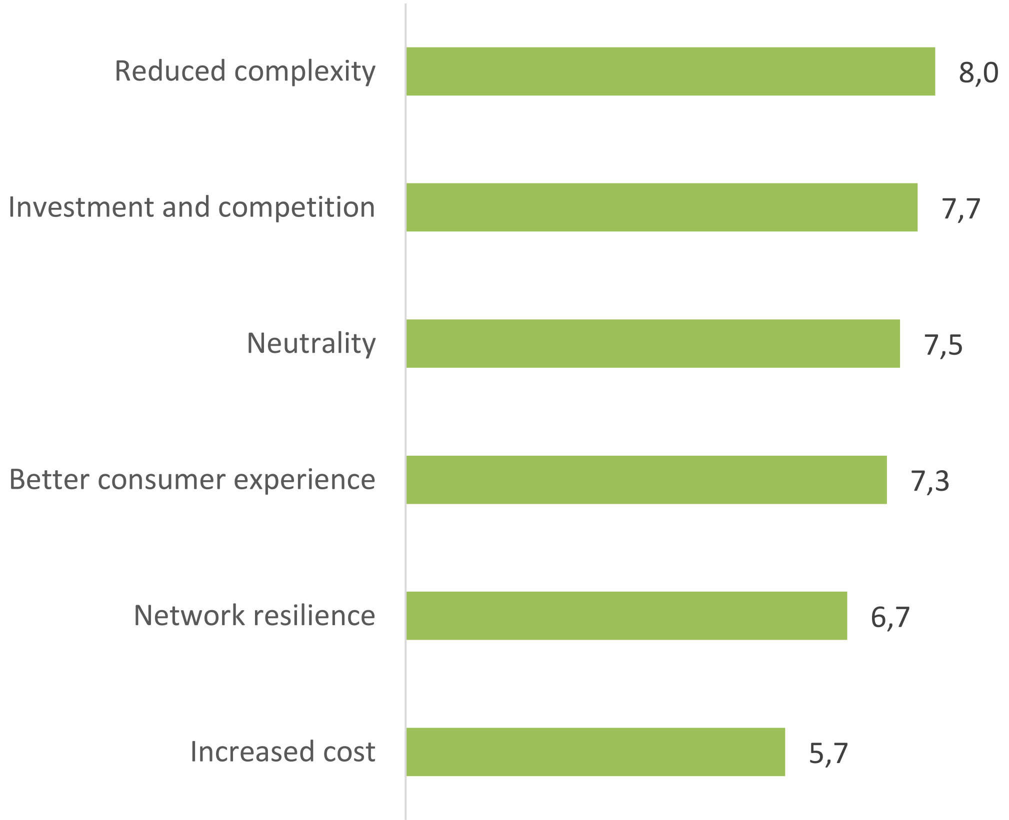
Q8: How should the billing between the Neutral Host and Operators/Verticals be done?



- *The majority of respondents believe that the billing relationship between the NH and operators should be based on the resources used from the latter. This is likely due to the belief that the operators should only be liable for the amount of NH resources they use, such as RAM, CPU core and Fiber as compared to the rest of the billing methods.*
- *Only 13% of respondents believe that a fixed fee relationship should exist between the NH and operators. This is likely due to the fact that operators/verticals prefer dynamic billing systems, which are tailored to their changing needs for access.*

NH vs. Joint Deployment Model

Q9: How important are the following aspects for an operator to choose the NH model over the Operators' Joint Deployment (OJD) model?



- *Respondents believe that reduced complexity would be the main reason why operators would be more keen to employ the NH model over the OJD model. This is likely due to the significantly less bureaucracy needed from the operator's side since the NH will take care of the relationships with third parties, such as municipalities, regulator and landlords.*

- *The investment and competition consideration ranks 2nd on the list, since a OJD model requires the operators to make the network investments by themselves. In the case of the NH model, operators will only need to pay for the usage of the resources. With regards to the competition element, the NH provides access to all parties on a non-discriminatory basis. Hence, smaller operators would prefer the NH model, due to their limited financial capabilities.*

Thank you!

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