

EXPLANATORY MEMORANDUM

1. This Explanatory Memorandum explains the Direction dated 27 October 2011, issued by the Info-communications Development Authority of Singapore (“IDA”) to OpenNet Pte Ltd (“**OpenNet**”), directing it to incorporate modifications to its proposed Schedule 12B (Co-Location Supplementary Cooling Service) (“**Schedule 12B**”) to its Interconnection Offer (“**ICO**”) to offer supplementary cooling service at its Central Offices to the Requesting Licensees, and to make consequential changes to Schedule 12 (Co-Location Service) and Schedule 15 (Charges) to its ICO.
2. Unless the context requires otherwise or unless specifically defined herein, all capitalised terms in this Explanatory Memorandum shall have the same meanings as in OpenNet’s ICO for the provision of services over the Next Generation Nationwide Broadband Network (“**Next Gen NBN**”).

Background

3. Under Schedule 12 (Co-Location Service) to OpenNet’s ICO, OpenNet provides cooling up to the heat load limit of: (i) 900 watts per square metre of a Requesting Licensee’s Co-Location Equipment footprint; and (ii) 1.5 kilowatts per rack of a Requesting Licensee’s Co-Location Equipment at its Co-Location Space. Some Requesting Licensees have since provided feedback that more cooling facilities at OpenNet’s Co-Location Space are required as it is necessary to deploy more equipment with higher heat load in order to meet their needs. In response to the Requesting Licensees’ feedback, OpenNet has proposed a set of terms and conditions under the proposed Schedule 12B to the ICO to offer a supplementary cooling service at its Co-Location Space for IDA’s approval.
4. To ensure that OpenNet’s proposed Schedule 12B is appropriate and adequate to address the concerns and needs of the industry, IDA sought feedback from the industry via a public consultation which commenced on 24 June 2011. At the close of the consultation on 15 July 2011, IDA received comments from three (3) respondents (namely, Nucleus Connect Pte Ltd, Singapore Telecommunications Limited and StarHub Ltd). Subsequent to the close of the public consultation, IDA has sought clarification from OpenNet with respect to the implementation of the Co-Location Supplementary Cooling Service.

Issues

OpenNet to Bear Cost of Providing Additional Cooling Capacity at the Co-Location Space

5. One respondent commented that OpenNet ought to bear the cost of providing the additional cooling capacity at the Co-Location Space since OpenNet ought to have provided adequate cooling to cater to the cooling needs of the Requesting Licensee’s Co-Location Equipment under the Next Gen NBN.

Another respondent commented that cooling ought to be a basic requirement of the Co-Location Service and it was unusual for Requesting Licensees to have to separately contract for the Co-Location Supplementary Cooling Service and bear additional costs as proposed by OpenNet.

6. IDA would like to clarify that the initial amount of cooling capacity provided by OpenNet under the Co-Location Service of 250 watts per square metre of the Requesting Licensee's Co-Location Equipment footprint was clearly specified in Schedule 12 (Co-Location Service) to the ICO, which was issued by IDA (together with the rest of the ICO service schedules) for public consultation in February 2009. The public consultation was intended to provide the industry with an opportunity to provide feedback on OpenNet's proposed ICO services. During the public consultation in February 2009, IDA did not receive any feedback that the cooling capacity provided by OpenNet was insufficient to address the needs of the Requesting Licensees. IDA does not consider that it is fair and reasonable to expect OpenNet, as a commercial entity, to bear the costs of providing additional cooling capacity without being able to recover them from the Requesting Licensees, especially if the costs are significant. Nevertheless, the prices for OpenNet's Co-Location Supplementary Cooling Service will be subject to IDA's review and approval, on a cost-oriented basis. With regard to the comment that the additional cooling service should form part of the Co-Location Service and should not be separately contracted at additional costs, while IDA is open to this charging option, IDA understands that not all Requesting Licensees who have purchased the Co-Location Service will require the Co-Location Supplementary Cooling Service. The ICO is structured in a modular manner to allow Requesting Licensees to purchase only those services that they require. Therefore, IDA believes it is reasonable for OpenNet to offer the Co-Location Supplementary Cooling Service in a separate service schedule.

Option to Requesting Licensee to Deploy Own Supplementary Cooling System

7. One respondent commented that OpenNet's proposed condition that Requesting Licensees shall not deploy their own supplementary cooling system if OpenNet had deployed the Co-Location Supplementary Cooling Service would effectively compel all Requesting Licensees to use OpenNet's Co-Location Supplementary Cooling Service even though more efficient and economically viable alternatives might be available to the Requesting Licensees. The respondent was of the view that OpenNet's proposal did not comply with (i) the NetCo Interconnection Code 2009, which stated that the ICO shall be "*....modular, allowing a Qualified Person to purchase only those Mandated Services that it wants to obtain;*" and (ii) the Telecom Competition Code 2010, which requires a Dominant Licensee's Reference Interconnection Offer to "*...be modular, allowing a Requesting Licensee to purchase only those Interconnection Related Services and Mandated Wholesale Services that it wants to obtain;*". The respondent opined that Requesting Licensees should have a choice to either acquire OpenNet's Co-Location Supplementary Cooling Service or to install their own supplementary cooling systems. The respondent added that OpenNet should offer its terms and conditions for

Requesting Licensees to deploy their own supplementary cooling systems in the ICO, and allow these terms and conditions to be subject to public consultation. The associated charges should be cost-based and be set on a cost-recovery basis.

8. IDA agrees that OpenNet must allow its Requesting Licensees to purchase only the Mandated Services they wish to obtain in accordance with the NetCo Interconnection Code 2009 and Telecom Competition Code 2010. In this regard, IDA considers that OpenNet should not prohibit Requesting Licensees from deploying their own supplementary cooling system in the Co-Location Space. Nevertheless, IDA notes that the majority of Requesting Licensees will likely opt to procure the Co-Location Supplementary Cooling Service from OpenNet in view of the synergies of obtaining the service from the provider of the Co-Location Service directly instead of deploying their own supplementary cooling system in the Co-Location Space. Therefore, IDA will not require OpenNet to provide a service offering in the ICO for Requesting Licensees who choose to deploy their own supplementary cooling system. Instead, OpenNet shall be required to negotiate in good faith a Customised Agreement with any Requesting Licensee who seeks to deploy its own supplementary cooling system in the Co-Location Space in accordance with the procedure as specified in Section 6 of the NetCo Interconnection Code 2009. All Requesting Licensees who wish to install their own supplementary cooling system must negotiate a Customised Agreement with OpenNet. IDA wishes to highlight that OpenNet, as a Dominant Licensee, has a duty to treat all Requesting Licensees in a non-discriminatory manner with respect to the prices, terms and conditions of all arrangements pertaining to the Requesting Licensees' deployment of their own supplementary cooling system, including obtaining rights of way and/or leasing of rooftop space or otherwise from the building owner.
9. With regard to OpenNet's concern that the Co-Location Supplementary Cooling Service may not be commercially viable if Requesting Licensees are allowed to deploy their own supplementary cooling system after OpenNet has deployed its supplementary cooling system, IDA believes that the concern is unfounded as the charges for the Co-Location Supplementary Cooling Service are set on a cost-recovery and cost-oriented basis.

Term of the Co-Location Supplementary Cooling Service

10. One respondent commented that the proposed eight (8) year term of the Co-Location Supplementary Cooling Service was too long and ought to be shortened to two (2) years to be commensurate with the minimum term of the Co-Location Service as cooling would not be needed when the Co-Location Service was terminated. Two respondents commented that the term of the Co-Location Service and the Co-Location Supplementary Cooling Service should not be different as cooling services were essential to the operation of the Co-Location Service.
11. IDA is cognisant that a Requesting Licensee should not be bound by the Co-Location Supplementary Cooling Service after the minimum two (2) year term

of the Co-Location Service expires. However, if the term of the Co-Location Supplementary Cooling Service is shortened to two (2) years over which the costs of the supplementary cooling system are fully recovered, and the Requesting Licensees continue to renew the Co-Location Service and the Co-location Supplementary Cooling Service beyond the two (2) year term, OpenNet will be over-recovering the costs of the Co-Location Supplementary Cooling Service. IDA is therefore of the view that there is merit for OpenNet to offer an eight (8) year term Co-Location Service which is commensurate with the eight (8) year term of the Co-Location Supplementary Cooling Service for those Requesting Licensees who wish to take up the Co-Location Supplementary Cooling Service. For the avoidance of doubt, OpenNet's charges for the eight (8) year term Co-Location Service should take into account the term of the Co-Location Service accordingly. OpenNet must also put in place arrangements in the ICO to allow existing Requesting Licensees who have taken the two (2) year term Co-Location Service to transition to the eight (8) year term Co-Location Service, so that existing Requesting Licensees who wish to align the duration of the Co-Location Service with that of the Co-Location Supplementary Cooling Service may do so.

Service Level Guarantee (“SLG”)

12. Two respondents commented that OpenNet ought to offer an SLG for the completion of the Site Preparation Work as it was a key and critical phase of the implementation of the Co-Location Supplementary Cooling Service. The respondents were of the view that OpenNet ought to provide a remedy to the Requesting Licensee if the Site Preparation Work was not completed in time. The respondents also commented that it must be mandatory for OpenNet to meet the On-Site Response Time, failing which OpenNet ought to provide a remedy to the Requesting Licensee.
13. IDA agrees that OpenNet ought to provide an SLG to the Requesting Licensees to ensure the timely completion of the Site Preparation Work, given that a delay by OpenNet would in turn cause a delay in the Requesting Licensee's service delivery. With regard to the On-Site Response Time, in light of the adverse impact to Requesting Licensees arising from a delay by OpenNet in responding to a reported fault on the Co-Location Supplementary Cooling Service, IDA also agrees that OpenNet must commit to an SLG to the Requesting Licensees to respond to a fault report within the On-Site Response Time to provide certainty to the Requesting Licensees that OpenNet will attend to a reported fault expeditiously.

System Redundancy

14. Two respondents were concerned that the lack of system redundancy in the Co-Location Supplementary Cooling Service might affect services to end-users. One respondent pointed out that in the event of a breakdown or during the maintenance of the supplementary cooling system, it was highly possible that heat would rapidly build up in the Co-Location Equipment which might lead to a service disruption. The respondent was of the view that OpenNet should not disclaim its responsibility for such possible occurrences and ought

to provide some form of redundancy for the service, especially in light of the fact that Requesting Licensees were not in a position to take any preventive action since OpenNet was the party operating the Central Offices and the supplementary cooling system.

15. IDA understands that in order to provide full system redundancy for the Co-Location Supplementary Cooling Service, OpenNet will need to install a duplicate supplementary cooling system at OpenNet's Central Offices. IDA takes the view that a duplicate supplementary cooling system may not be an optimal approach to address the concerns on the lack of system redundancy. A duplicate supplementary cooling system will significantly increase the cost of the Co-Location Supplementary Cooling Service, and reduce the amount of leasable space in OpenNet's Central Offices, which may in turn lead to an increase in the charges for the Co-Location Service. Furthermore, there might be insufficient space in OpenNet's Central Offices to install the duplicate supplementary cooling system. Notwithstanding the above, IDA recognises that a lack of system redundancy might adversely affect the proper functioning of the Requesting Licensees' Co-Location Equipment when the supplementary cooling system is out of service. In this regard, IDA requires OpenNet to put in place robust measures to provide sufficient cooling in the Co-Location Space to ensure the proper functioning of the Requesting Licensees' Co-Location Equipment when the supplementary cooling system is not in service, and to clearly state such measures in the ICO to provide certainty and clarity to the Requesting Licensees.

"End of Life"

16. Two respondents commented that it was unfair and unreasonable for OpenNet to pass the risks of an "End of Life" event to Requesting Licensees and that OpenNet's proposed "End of Life" provisions should be deleted from the ICO. The respondents commented that if an "End of Life" event was allowed to be addressed in the ICO, OpenNet ought to be solely responsible to ensure that when the supplementary cooling system reached its "End of Life", the replacement system must be appropriate and comparable to the original system, and that Requesting Licensees should not have to incur any additional costs, nor should it affect OpenNet's obligation to ensure service continuity. Another respondent expressed the view that OpenNet should not be allowed to unilaterally vary the ICO by offering a replacement system or service on "revised specifications, prices, terms and conditions" without seeking IDA's approval. The respondent added that it was impracticable that the Requesting Licensee must either accept OpenNet's offer or be left without a cooling service from OpenNet. The respondent suggested that OpenNet ought to be required to amend Schedule 12B to state that (i) it would provide at least six (6) month's notice to the Requesting Licensees, or otherwise as long as reasonably practicable, if it became aware that the supplementary cooling service would reach its "End of Life"; (ii) at the time of notice, it would propose the new, additional or replacement system, and the associated revised specifications, prices, terms and conditions; and (iii) it would consult the affected Requesting Licensees on the proposal and submit the proposal incorporating the Requesting Licensees' comments to IDA for approval.

17. IDA is of the view that OpenNet should be allowed to address the “End of Life” risks of the supplementary cooling system in the ICO to the extent that OpenNet is not responsible for the system reaching its “End of Life”. However, IDA agrees with the industry that OpenNet should not be able to unilaterally vary the ICO in relation to the Co-Location Supplementary Cooling Service by offering the replacement Co-Location Supplementary Cooling Service on revised prices, terms and condition without first notifying and consulting the Requesting Licensees, as well as seeking IDA’s approval. Furthermore, IDA is of the view that the prices, terms and conditions proposed by OpenNet for the replacement Co-Location Supplementary Cooling Service must not be worse-off than the terms offered under the original Co-location Supplementary Cooling Service, and that additional charges should not be imposed, unless there are justifiable reasons for doing so, to provide certainty to the Requesting Licensees. IDA is of the view that it is fair and reasonable to expect OpenNet, as the provider of the service, to put in place robust plans to anticipate and address major risks related to an “End of Life” event. Therefore, OpenNet ought to be well-prepared and be capable of minimising any adverse impact of an “End of Life” event on the Co-Location Supplementary Service under the ICO. In view of the above, IDA requires OpenNet to amend Schedule 12B to state clearly that (i) it shall provide at least six (6) month’s notice to the Requesting Licensees, or otherwise as long as reasonably practicable, from the time it becomes aware or ought reasonably become aware that the supplementary cooling system will reach its “End of Life”; (ii) at the time of notice, it shall propose the new, additional or replacement system, together with the associated revised specifications, prices, terms and conditions; (iii) it shall consult the affected Requesting Licensees on the proposal and submit the proposal incorporating the Requesting Licensees’ comments to IDA for approval; and (iv) it shall offer the replacement service on prices, terms and conditions that are no worse-off than the original Co-Location Supplementary Service, and that additional charges shall not be imposed, unless there are justifiable reasons for doing so and such changes are approved by IDA.

Determination of Cooling Requirements

18. One respondent expressed the view that the ICO was unclear about how the actual cooling requirement of each Requesting Licensee would be determined. The respondent was concerned that unless clear guidelines were laid out in the ICO, the second Requesting Licensee could possibly unfairly benefit from the circulating cooled air from the first Requesting Licensee which had taken up the Co-Location Supplementary Cooling Service, such that it would not be necessary for the second Requesting Licensee to take up the service. The respondent was also concerned that if sufficient Requesting Licensees had taken up the Co-Location Supplementary Cooling Service leading to lowered temperatures in the Co-Location Space, OpenNet might not provide the basic level of cooling it was obliged to provide under the Co-Location Service. Besides the above issues, the respondent opined that there was a need to make clear in the ICO whether a cooling unit could be shared amongst multiple Co-Location Equipment racks.

19. IDA recognises the respondent's concerns that the cool air from the Co-Location Supplementary Cooling Service taken up by some Requesting Licensees might possibly confer unfair benefits to other Requesting Licensees and OpenNet. IDA believes that it is premature at this juncture to conclude that Requesting Licensees will depend on cool air from other Requesting Licensees to cool their Co-Location Equipment without any contractual safeguards, given the importance of cooling to the proper functioning of their equipment. With regard to OpenNet delivering the basic cooling service, under the current ICO, OpenNet is already obliged to do so and would be in breach of its ICO if OpenNet failed to do so. However, IDA agrees that there is merit to clearly set out in Schedule 12B the process and methodology governing how OpenNet will determine the number of supplementary cooling units that needs to be taken up by each Requesting Licensee which requires the Co-Location Supplementary Cooling Service to provide clarity, certainty and transparency to the Requesting Licensee. Notwithstanding the above, IDA is cognisant of the concerns with the "spillover" cool air and will monitor the matter during the implementation of the service. With regard to the sharing of a cooling unit amongst multiple racks, IDA understands that this is a non-standard arrangement and a Requesting Licensee who wishes to opt for such an arrangement may wish to negotiate a Customised Agreement with OpenNet.

Interim Period before Co-Location Supplementary Cooling Service is Taken Up

20. One respondent commented that OpenNet should address the situation where the Requesting Licensee's Co-Location Equipment had already exceeded the heat load limit per rack, but the overall heat load in the Co-Location Space had yet to meet the minimum threshold required by OpenNet's supplementary cooling system to operate. The respondent was concerned that Requesting Licensees would be restricted in their ability to expand their operations if there was insufficient cooling for their Co-Location Equipment during the interim period. The respondent commented that OpenNet should be required to extend its existing Customised Agreement with Requesting Licensees such that they would be able to continue their operations without being restricted by the lack of supplementary cooling service until the minimum heat load threshold in the Co-Location Space was reached.
21. IDA agrees that OpenNet ought to put in place arrangements to address the possibility that there might be a period where the minimum heat load threshold in the Co-Location Space may not have been met but the Requesting Licensees' Co-Location Equipment has already exceeded the heat load limit per rack specified in Schedule 12 (Co-Location Service). Currently, OpenNet has already entered into Customised Agreements with Requesting Licensees to address the cooling needs of Requesting Licensees whose Co-Location Equipment has already exceeded the heat load limit per rack specified in Schedule 12 (Co-Location Service). IDA is of the view that it is fair and reasonable to expect OpenNet to continue to address the cooling needs of both new and existing Requesting Licensees under a Customised Agreement

arrangement that is no worse-off than the existing Customised Agreements between OpenNet and a number of Requesting Licensees, until the minimum heat load threshold in the Co-Location Space is reached, as OpenNet, the provider and operator of the Co-Location Service, should be responsible to address the cooling needs of Requesting Licensee's Co-Location Equipment at all times.

Charging Principles

22. One respondent commented that OpenNet's proposed charges for the Co-Location Supplementary Cooling Service ought to be subject to public consultation. The respondent requested IDA to make available the charges for the Co-Location Supplementary Cooling Service as soon as possible and subject them to public consultation as it was currently unclear how OpenNet intended to charge for the service and the charges might have a bearing on the industry's feedback on the terms and conditions of the service. Two respondents commented that OpenNet must state its cost allocation principles for costs which were shared by the Requesting Licensees (e.g. overheads, initial set up costs and cost of shared systems), so that the first Requesting Licensee would not have to pay a higher proportion of such costs. The respondent added that such costs should be shared based on the proportion of space taken up by each Requesting Licensee in the Co-Location Space. Finally, one of the respondents also requested that OpenNet must specify all cost components, and not be allowed to introduce any cost component not specified in the ICO without IDA's approval.
23. IDA would like to clarify that OpenNet's charges for the Co-Location Supplementary Cooling Service are set on a cost-oriented and cost-recovery basis, and are subject to IDA's audit. In this regard, IDA is of the view that it is not meaningful to subject OpenNet's charges for the Co-Location Supplementary Cooling Service to a public consultation. IDA is currently reviewing OpenNet's charges and will publish the approved charges as early as possible. IDA notes the industry's concern that the first Requesting Licensee should not bear a disproportionately high portion of the common costs associated with the Co-Location Supplementary Cooling Service. In this regard, IDA will ensure that such costs are fairly allocated, where applicable. Finally, IDA agrees with the industry's comment that OpenNet should clearly specify all the cost components of an ICO service in the ICO, and should not be allowed to impose charges which are not specified in the ICO, to provide certainty to the Requesting Licensees. As the industry is aware, OpenNet is already under an existing obligation in relation to the foregoing for the existing ICO services and OpenNet will be required to comply with the same obligation for the Co-Location Supplementary Cooling Service.