NVIDIA Comments on Draft 2 Version 5.0 ENERGY STAR Computer Specification 10/1/08

- The data does not show a scaling based on system memory size so I would recommend the deletion of the system memory power adder. The TEC numbers should be based on the collected data regardless of system memory size. Everybody, at the meeting, agreed that the power adder of system memory is very small.

- The data does not show a clear scaling based on the number of CPU cores. Moreover, there are very, very few applications that can scale beyond two CPU cores today so I do not see how a quad-core or even an eight-core processor in the future should get a power adder when it serves no clear benefits to the majority of end-users.

- The data clearly shows a scaling with respect to discrete GPU frame buffer width.

- The desktop classes are, in my opinion, correct in terms of TEC but we absolutely need to allow a 256-bit GPU coupled with a less-than-3-cores CPU to fall in category C. It is presently a lot cheaper for an end-user to upgrade to a 256-bit GPU than to go from a dual-core to a quad-core CPU with the end-user experience being so much more enriched with a better GPU compared to having a better CPU. Graphics add-in cards with a 256-bit frame buffer width GPU can now be found for less than $120 so 256-bit is not high-end anymore. I question the use of system memory as a differentiator and I believe that very few desktop systems will end up with a memory size of less than 2GB. I would remove the 2 HDD optional class C requirement, the input at the meeting claiming that very few systems ship with 2 HDDs.

- Notebook is more challenging because of the netbook emerging segment as well as workstation not covering the notebook workstation computers.

- A simple way to solve the netbook "issue" may be to change category B to be IGP only. You may want to consider removing the netbooks (the 11 you mentioned in the presentation) out of the IGP data to determine the IGP category TEC level. This way, nobody can argue about netbooks bringing the TEC down and the bar should be easier to meet for netbooks which is good since these devices will be energy efficient anyway and if they meet the TEC level of this new IGP category B then this is great news for the world's energy consumption. It is very difficult to define what a netbook is at this moment so I would wait until 2011 to create a netbook category if it still applies.

- As for covering the notebook workstation, I would create a notebook category C that mandates the use of a discrete GPU only and provide an adder based on frame buffer width. You may want to set the TEC level using the 64-bit data so that a notebook using a 64-bit FB or less has to meet that TEC level and then provide an adder for 64 < FB <=

128-bit (using the 128-bit FB width data) and one for FB>128-bit (using the 256-bit FB width data).

- I was surprised to hear that you did not receive enough data to be able to use the SPEC active workload. This is unfortunate. One clear challenge and implication that this has it that it puts a burden on meeting the EnergyStar level for 2D workstations. These computers are not designed for 3D performance so their VIewperf performance is low and therefore tge max power is much lower than when using a 3D workstation GPU. Moreover, these 2D workstations, which can be used in the financial world for example, have more than one GPU on each add-in card, increasing the idle power compared to a single GPU add-in card, The result is that you have a higher idle power and a lower max power making it pretty much impossible to meet the PTEC over Pmax ratio as required for the desktop workstation category. A possible option here is to qualify these systems as desktop computers instead of desktop workstations but this would require a power adder for the second GPU. I would give it an adder corresponding to a 9W idle power increase, corresponding to the idle power of a 64-bit GPU which is usually what is being used for the 2D workstation market.