

Public Comment to FESAC on the FESAC Strategy Panel Report

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My name is Steve Dean. Although I am president of Fusion Power Associates, these are my personal views.

None of us has had time to read the panel's report, so this is based on the summary presentation by panel chair Mark Koepke and his handout.

The draft strategic plan is aimed at accomplishing a "Vision 2025", which is stated as "U.S. Will Continue as a World Leader in Fusion". However, the plan then goes on to indicate that under the budget assumptions provided, the U. S. will have to choose to lead in only a few selected areas. I do not find the Vision statement to be compelling. I do not see it as measurable. What would be expected to be accomplished in the four separate budget cases do not provide a compelling case for selecting one over another. For example, in the most optimistic budget case it is stated that in this case "Vision 2025 has an acceptable probability of being achieved", with both Tier 1 and Tier 2 initiatives going forward, whereas in the most pessimistic case it states that in this case "Vision 2025 will be partially met", with Tier 1 initiatives going forward and Tier 2 leadership passing to other international partners. Why that should matter to those providing fusion budgets is not explained.

I believe the draft report would be strengthened if a section were added describing the plans of non-U.S fusion governments, such as Korea, China, Japan and Europe. This would make it clear that the plan being provided pales in comparison to those more aggressive fusion development plans.

I recognize that the panel was provided a charge by DOE that severely constrained its considerations. For example, they were to consider that ITER would be built and that the U.S. would provide its share of the funding separate from the budgets the panel was to consider. However, I think it is very important for the FESAC to show some sign of its awareness of the ITER situation and its implications for future fusion power plants for the U.S. market. The cost of the U.S. contribution to ITER is estimated at between 4 and 6 billion dollars of which less than \$1B has been spent to date. The FY14 U.S. budget ITER allocation was \$200 M. At that rate it will take between 15 and 25 years for the U.S. to deliver its hardware to ITER. It is not clear at all that the U.S. government is prepared to provide the funds to complete ITER in 10 years or less, but do not for a moment think that some of that money is not going to come out of the budget cases you have been given. Also, the fusion community needs to seriously consider the implications for the cost of fusion power plants extrapolating from the cost of ITER. If the U.S. cost for a 9 percent share of ITER cost is \$4B, then ITER would cost the U.S. around \$40 billion to replicate and a power plant would cost even more. No U.S. utility would pay that much for a fusion power plant. The draft report

shows no concern for this and does not propose the kinds of conceptual design studies and R&D that would lead to lower cost power plants. This, in my opinion, is a major flaw in the draft report. The ultimate goal of the fusion program of delivering a commercial power source to the U.S. market is absent from the report. There are concepts in the fusion community, including "white papers" submitted to the panel, that address this problem. For example, a white paper from Dennis Whyte from MIT describes a fusion pilot plant that would be half the major radius of ITER and cost perhaps a factor of 4 or 5 less than ITER and would still make over 200 Megawatts of fusion electric power in steady state. This is based on a very affordable development program for high field, high temperature superconducting magnets. MIT has long pointed out the large impact that high field magnets could have on the size and cost of fusion power plants, yet the panel almost writes off the MIT fusion program.

I suggest that the FESAC comment on some of these points in its covering letter if suitable changes cannot be made in the draft report.