

July 20, 2020

To: Dr. Beatrix Vierkorn Rudolph, Chair of the Governing Board of Fusion for Energy
cc: Dr. Radomir Panek, Co-chair of the Governing Board of Fusion for Energy
cc: Dr. Maria Faury, Co-chair of the Governing Board of Fusion for Energy
cc: Kadri Simson, Commissioner, Directorate-General for Energy

SUBJECT: Misleading Claims By Fusion For Energy About ITER

Dear Dr. Rudolph,

I am deeply concerned about the scientific integrity of the public messaging by the Fusion for Energy organization under the direction of Dr. Johannes Schwemmer. I have discussed my concerns with Dr. Schwemmer since June 17, 2018.

If you are already familiar with the subject matter, you may wish to skip directly to page 4.

BACKGROUND

Many fusion energy organizations have, intentionally or otherwise, engaged in a practice of communicating claims that were either [false or misleading](#) for non-experts. Soon after I published previously undisclosed power facts about the ITER reactor in my [October 2017 investigation](#), these organizations began to make corrections to their public claims.

For two decades, public messaging from organizations in the fusion community created the false impression that the ITER reactor is designed to a) consume only 50 megawatts of power, b) produce 500 megawatts of power, c) demonstrate that a fusion reactor can produce 10 times the power it uses, and d) demonstrate that a fusion reactor can produce power equivalent to that of a small conventional power plant.

In reality, if all goes according to plan, the ITER reactor will produce the equivalent thermal power as it consumes in electricity. Initially, I found this information on the Japanese JT-60SA project Web site. It says "[ITER is about equivalent to a zero \(net\) power reactor.](#)"([Archive copy](#))

As confirmation, I contacted three fusion experts: Daniel Jassby, a former principal research physicist at the Princeton Plasma Physics Laboratory; Hartmut Zohm, the head of

the Tokamak Scenario Development Division at the Max-Planck-Institute of Plasma Physics; and Steven Cowley, the current director of the Princeton Plasma Physics Laboratory and former chief executive officer of the United Kingdom Atomic Energy Authority.

Later, after the U.K. left the EU, Nick Holloway, the media manager for the U.K. Atomic Energy Authority and Culham Centre for Fusion Energy, added this to the UKAEA Web site: "[ITER should produce about as much fusion power as the electricity required to run the entire plant.](#)" ([Archive copy](#))

REAL PURPOSE OF ITER

The correct power values are defined in the 2002 International Atomic Energy Agency [design specification](#) for ITER. But when fusion representatives told the public the objectives of ITER, they omitted essential details and their definition of "fusion power."

The design specification for ITER states a power goal that applies only to the plasma. It is a goal that has nothing to do with the overall reactor power production or overall power consumption.

Additionally, the much-publicized input power value of 50 megawatts had been depicted incorrectly because fusion representatives had failed to make a key distinction publicly. According to the ITER design specification, the amount of thermal power that reaches the inside of the chamber to heat the fuel will be 50 MW. However, the amount of electrical power consumed to create that 50 MW of heating power will be 150 MW.

But none of this had been communicated clearly by the international fusion community for two decades. Instead, as evidenced by nearly all examples, [including reports from the most authoritative news sources, public encyclopedias, European Union government documents, a White House press release, U.S. Congressional records, and documents published by ITER contractors for their investors](#), the international fusion community created the false impression that the ITER reactor should produce 10 times the power it consumes.

Since the publication of my October 2017 investigation, most leaders and representatives in the fusion community have [corrected their public messaging](#) to be more (but not completely) accurate and transparent. A few months ago the European Commission made a [crucial correction](#) to its [previous descriptor](#) of the primary ITER objective.

TRANSPARENCY

However, some fusion representatives now claim that they are not ethically obligated to disclose the overall amount of power expected to be consumed by the ITER reactor. They

defend their omission based on the fact that the reactor's primary objective is not to make overall net power.

That argument is deceitful. For nearly two decades, fusion representatives' claims have resulted in the public perception that the ITER reactor's primary objective was to make overall net power. Therefore, their failure to disclose the overall power expected to be consumed by the reactor constituted an ethical omission.

At this time, Fusion for Energy is one of the few organizations still claiming that the overall reactor's primary objective is to make net power. Fusion for Energy is also failing to disclose the overall expected power consumption. This is not honest.

NEW CLAIMS

In my early communications with Dr. Schwemmer, between June 17, 2018, and April 4, 2019, I told him about 12 specific Web pages or documents that contained claims that were misleading and exaggerated.

By the end of 2019, he had made a partial correction to only one of these items. In a recent redesign of the Fusion for Energy Web site, eight of the 12 erroneous items were removed. The remaining items with problematic claims include the [English-version brochure](#), the [Spanish-version brochure](#), a [Fact Sheet](#), and a [Postcard](#).

In his last letter to me, Dr. Schwemmer said that he was unwilling to respond to any further letters from me or make further corrections. Therefore, I am writing to you to about this situation.

In his own words, from his Nov. 9, 2018, letter to me, Dr. Schwemmer said that the accurate way to represent the primary objective and goal of ITER is to **"ensure that there is no possible misunderstanding on the ITER energy gain of 10 - [that it is] linked only to the plasma and not to the energy balance of the overall ITER plant."**

Yet Fusion for Energy, under Dr. Schwemmer's leadership, does otherwise. The organization has just published a new set of inaccurate, misleading, and exaggerated claims (as would be perceived by people who are not experts in fusion) in three places on the Fusion for Energy [ITER Web page](#). In the following pages, I list the current statements followed by examples of accurate statements.

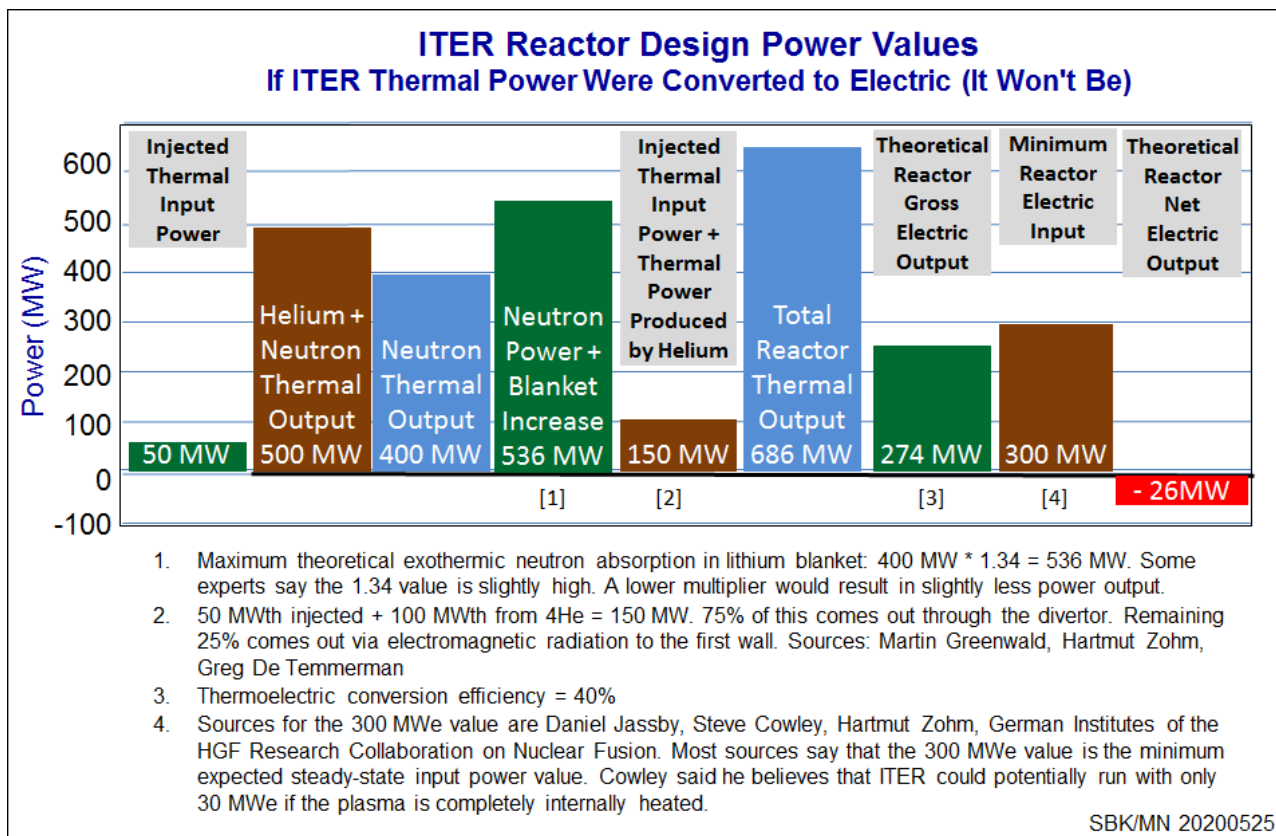
CLAIM #1



CURRENT STATEMENT

"ITER, which in Latin means 'the way,' will be the world's biggest experiment on the path to fusion energy. It will be the first fusion device to generate more energy than that it consumes."

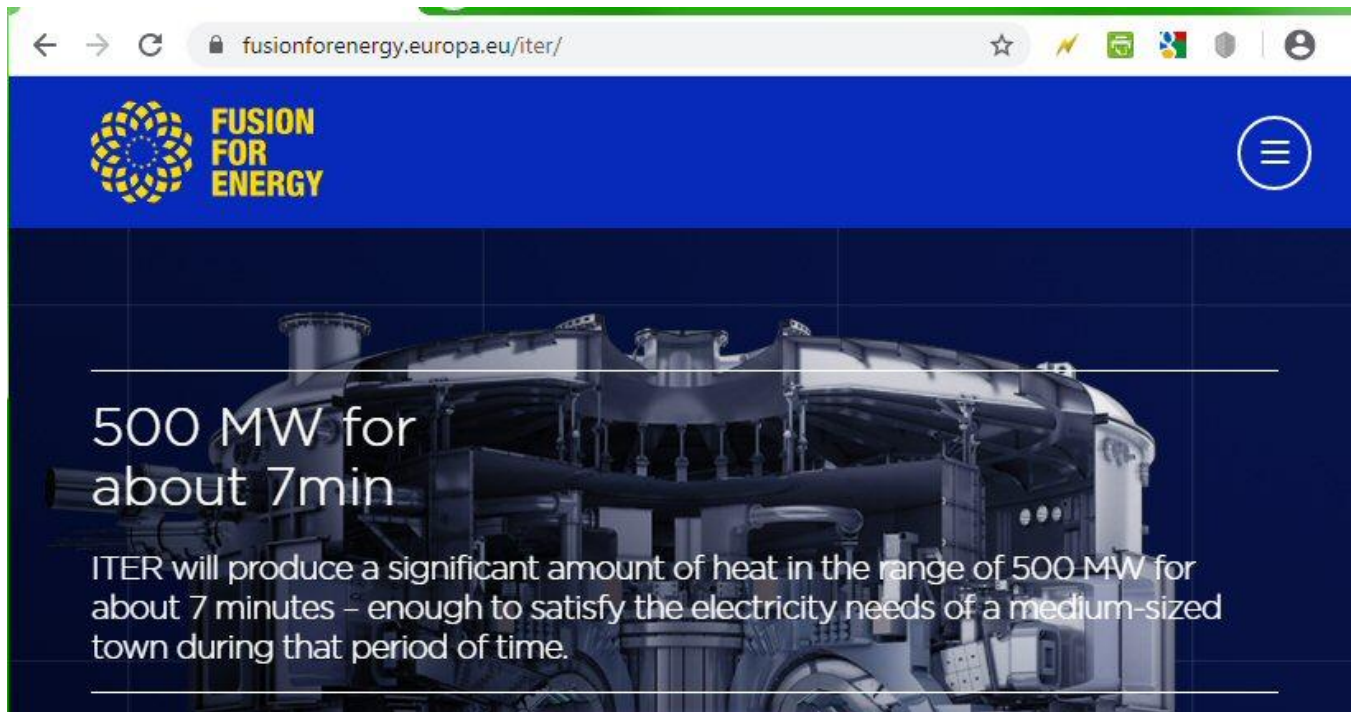
NOTE: *This is false: The device itself is expected to demonstrate zero net power; see the power values in detail below.*



ACCURATE STATEMENT

"ITER, which in Latin means 'the way,' will be the world's biggest experiment on the path to fusion energy. It will be the first fusion device to produce a fusion plasma that has more thermal power than the heating power injected into the plasma."

CLAIM #2



CURRENT STATEMENT

"500 MW for about 7 min"

"ITER will produce a significant amount of heat in the range of 500 MW for about 7 minutes – enough to satisfy the electricity needs of a medium-sized town during that period of time."

NOTE: This is dishonest and misleading: If ITER was designed to convert the net thermal power output to electricity there wouldn't be enough net power to produce one Watt. Based on the ITER design, the overall reactor will produce 686 MW gross thermal output. If this was converted to electricity, it would result in 274 MW gross electrical power and negative 26 MW net electrical power.

ACCURATE STATEMENT

"A 500 MW plasma for about 7 min"

"ITER will produce a fusion plasma with a significant amount of thermal power in the range of 500 MW for about 7 minutes."

CLAIM #3



CURRENT STATEMENT

"10 times more thermal power"

"ITER will generate 10 times more thermal power than the one received."

NOTE: This is misleading. To be accurate, all power claims must clearly be associated with the plasma.

ACCURATE STATEMENT

"ITER will produce a fusion plasma with 10 times more thermal power than the heating power injected into the plasma."

Research Integrity

I hope this information is helpful to you and the Fusion for Energy Governing Board so that you can ensure that Johannes Schwemmer a) leads this publicly funded European Union organization in concordance with the expected conduct of a professional scientist and b) does so in a manner that is respectful of European taxpayers' right to honest and accurate scientific claims.

Best Regards,

Steven Krivit

Publisher and Senior Editor, *New Energy Times*