2–Figure 1

- We suggest using an updated version of the 2002 US Energy Flow Trends chart (LLNL [link]) to replace current figure 1

2.2–Par 1; re: "Importantly, the 80% efficiency depicted in Figure 1…"

- Expand on where 80% comes from: Unclear how 80% and efficiency is read in Figure 1
- Also to note, and perhaps address in paragraph: distinct measures of efficiency exist for specific applications. For example, coefficients of performance (COP) greater than 7 (as compared with the 0.8 COP implied by the figure) are routinely achieved by heat pumps.

2.4–Section Title; re: "Supply Changes Slowly, Demand Rapidly"

- Change title due to incorrect/misleading statement: while the lifetimes of elements of the supply infrastructure are typically longer than those of the demand infrastructure, there are many cases of interest where the reverse is true. For example, a home PV array might last 10 years while the wiring in the house it powers could easily last 50. Similarly, factories often outlive the power plants from which they draw electricity.
- We suggest using "Supply and demand sectors face different challenges" or another general title in replacement

2.8–Content

- Add content: we suggest including background on historical performance of and challenges faced by the DOE that is more specific and quantitative, so that readers can compare with current challenges posed in next section

3–Content

- Add and reorganize content: Include not only current, but also future challenges; address what challenges the existing infrastructure and policy landscape create for today, as well as the challenges our existing landscape can create in the near and long term future

3.2–Content

- Add content: Mention rare earth mineral security and other resource depletion/importation challenges relevant to the energy sector
- Add content or remove for simplicity: Re: "Energy and water are linked…"; specific example of water runoff is sole and out of place; suggest either adding additional examples relevant to a variety of US regions or removing entire paragraph and replacing with "presents a variety of potential risks" with a link to Administration or IPCC literature on climate impacts.
- Clarify content: Re: transition between sentence "For example, highly radioactive…" and "The burning of fuels…"; the first sentence is about nuclear energy and the second about all fossil fuels; this transition is not explained and is confusing; we recommend including a transition sentence, or a more comprehensive summary of the environmental and public health risks from a variety of current energy sources

3.3–Content

- Suggest re-write: Section does not adequately address the main scientific arguments, findings, and scope of the environmental impact. Also not particularly in line with other Administration-wide documents, such as the National Assessment, Global Change Report, NOAA Climate Report, and IPCC

4–Content

- Change focus of content: Change description of DOE activities specifically to address (1) how DOE is addressing the challenges posed in Section 3; (2) Current and near-future DOE goals and DOE activities supporting those goals; (3) major DOE activities that were carried/passed on from previous administrations, even if not necessarily aligned with current goals

Response to 1)

5.1–Structure

- *Change the length and substance of the mission statement: We believe the value is in the explanations of each word in the statement; We recommend a longer mission statement that includes substantial additional detail.*
- *Add to mission statement: (1) Include cross-Administration collaboration (working with other branches of the Federal Government to pursue DOE goals efficiently); (2) Aid in navigating federal, state, and local regulatory issues facing DOE Activities/DOE-funded projects.*

5.2.1–Content

- Add content: Suggest adding content on the importance of R&D in industry and of the research arms of private industry
- Address DOE's activities with long time horizons: We suggest including current work/funding and future DOE goals in promoting long-term research, potential breakthroughs and innovation (i.e. ARPA-E & loan guarantees)
- Recommend focus: We recommend funding basic and applied industrial research and if so, including such activities in report

Response to 2)

- *Produce manufacturing capital in US for use abroad, (2) fund US deployment, (3) DOE activities should also support projects with potentially large payoffs farther in the future, i.e., projects expecting late but rapid growth. For example, the DOE should fund projects that may not reach 1 Quad in 2030 but may potentially reach 3 Quads in 2050.*

5.2.2

Response to 3)

- *Diversify time horizons for projects, depending on goals.*
- *Set targets by auction. For example, DOE might put out a call for proposals for solar photovoltaics that asked proposers to set their own $/W goal. The ambitiousness of the goal could be a criterion used in selecting proposals. A well-designed auction mechanism could discover the appropriate $/W goal even in a process intending to award multiple grants.*
- *Keep competitive grant projects for riskier technologies and provide them to Universities* ***and industry***
- *We strongly encourage the continuation of funding for ARPA-E and similar projects*

Response to 4)

- *(a) Consider partnering with industry to create the equivalent of Bell Labs for energy. Key aspects of this would include: 1) a clear private owner of all IP, 2) research with a broad scope and a long time horizon, 3) focus on creating a profitable research enterprise committed to bringing new technologies to market.*

- *(c) Make use of prediction markets to aggregate, with unprecedented honesty and accuracy, desired information from private sector partners without revealing un-needed but sensitive information or the sources of useful information.*

Response to 5)

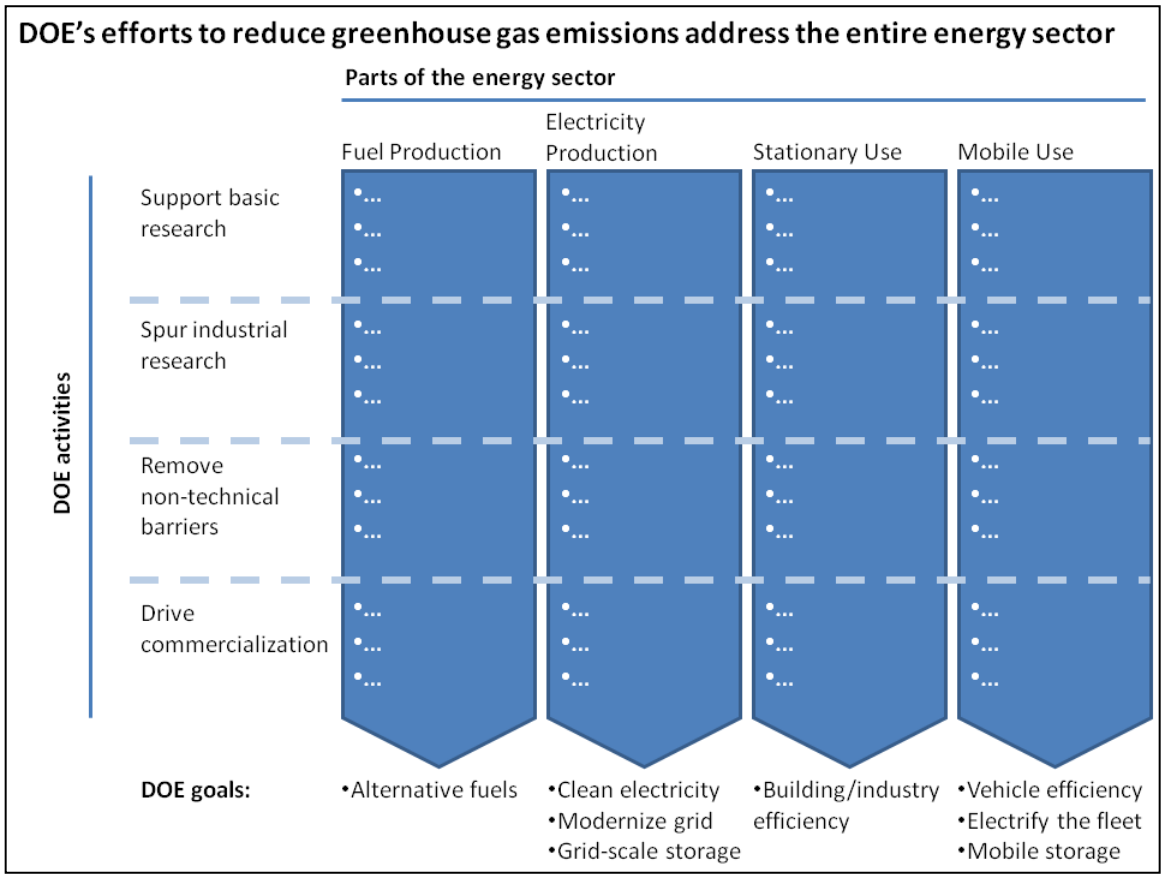
- *Record results of all research and deployment/implementation projects funded by DOE, whether positive or negative, and make them publicly available. This will focus research towards new goals, reduce redundancy, and reduce re-iterations of failed experiments/methods/processes.*

Response to 6)

- *Create regional offices to address local and state regulatory barriers to DOE and other Administration-wide energy sector activities*
- *Although primarily a technical agency; we strongly recommend that for DOE activities, DOE identify the non-technical pressing needs and barriers and work to address them*

Response to 7)

- *We suggest reorganization and re-make of graphic.*
- *Suggested replacement figure below drafted by commenters (we would be happy to assist in further revisions to this graphic). Note: bullet points are placeholders for specific DOE initiatives.*



- *We suggest including a focus/strategy within DOE on applied social science research (e.g. behavior and energy use and energy economics)*

- *Include energy storage (for renewables) among the top 6 strategies (making it 7)*

Response to 8)

- *Encourage energy conservation.*

6.1.3.1–Content

- Address the challenges and risks in ethanol development due to food security

6.1.3.2–DOE Activity

- Synfuels with CCS should be considered for large deployment projects

7–Content

- Add content: Address/explain what the goals and process will continue to be for the QTR. We suggest explaining how the QTR will be used by the DOE and how it will affect DOE activities moving forward. Address how QTR will potentially differ each time it is undertaken. Address what aspects will be monitored and measured to assess DOE's performance relative to goals established during QTR.
- Add content: Include information on DOE's performance relative to its goals on energy activities; provide significant specificity with goals regarding development of energy technologies.