

# APSC 498T

## Case Study Assignment Description and Rubric

Due Date: March 5th - 21st

Groups: 2 max

### Description:

Present a thorough analysis on a type of technology (or set of technologies) with *transformative decarbonization potential*. The technology can be at any stage of readiness or deployment, but must be realistically feasible to reach market by 2050. Geographical extent is not constrained, but should be presented in a specific context. Introduce the technology to the class with sufficient technical background to describe the engineering principles. Present a market analysis for the technology that includes basic financial information. Describe in some detail policies that could be used to encourage the development and/or deployment of the technology. These connections are meant to be at a conceptual level, do not feel pressed to get extremely detailed. If needed, assign a pre-reading for background knowledge.

This case study is essentially your opportunity to take charge of the class and investigate a technology that interests you! Ensure you plan enough content for the whole 80 minutes, which can include facilitated discussion. With this in mind, you may or may not want to include a pre-reading or reading reflection. If you do include one please ensure it is a reasonable amount of pages and useful material for your case-study.

### Deliverables:

- Presentation (40-60 minutes)
- Discussion (0-40 minutes)
- Reading Reflection (0-20 minutes)

### Note on Topic Selection:

Please avoid being too vague with your topics for example “solar energy” is not sufficient. However choosing “utility-scale deployment of silicon PV arrays” or “distributed solar systems with battery backup” would be more specific.

### Example Topics:

- Carbon capture, storage, and utilization (Ash and Jackson will present this)
- Wind and solar electricity on the grid
- Grid-level energy storage
- Electric / fuel cell vehicles
- Land use mitigation methods
- Energy efficient buildings
- etc.

## Case Study Rubric

Peer-graded by the entire class. Peer-grading is anonymous.

Assign a number between 1 (does not meet expectations) and 10 (or 5) (exceeds expectations) for each category. Guidelines for expectations are provided:

**Technology Description and Engineering Principles:** \_\_\_\_\_/10

| <b>10<br/>Exceeds<br/>Expectations</b>   | <b>6<br/>Meets Expectations</b>  | <b>4<br/>Partially Meets<br/>Expectations</b>   | <b>1<br/>Does Not Meet<br/>Expectations</b>  |
|--|--|---|--|
| Thorough explanation of the scientific and engineering principles of technology, with diagrams, data, or figures to backup the explanation. Technical terms are defined and appropriately applied. Explanations are complete and comprehensible to a general audience. Multidisciplinary analysis of forward-looking engineering challenges. | Basic description of the scientific and engineering principles of the technology. Technical terms are defined and explanations are comprehensible to a general audience. Forward-looking engineering challenges are presented. | Technology is introduced, but the technical description lacks depth, clarity, and/or accuracy. The technical description may include jargon and not be comprehensible to a general audience. Forward-looking engineering challenges are insufficiently addressed. | Explanation is not clear or topic is too vague for thorough analysis. Scientific or engineering presentation is incomplete and/or incorrect. Forward-looking engineering challenges are not addressed. |

**Economic and Market Analysis:** \_\_\_\_\_/10

| <b>10<br/>Exceeds<br/>Expectations</b> | <b>6<br/>Meets Expectations</b> | <b>4<br/>Partially Meets<br/>Expectations</b> | <b>1<br/>Does Not Meet<br/>Expectations</b> |
|--|---------------------------------|---|---|
| Economic case for                      | Economic case for               | Economic case for                             | Information provided                        |

|   |  |   |   |
|---|--|---|---|
| <p>the technology deployment is clearly presented, including current level of deployment in a geographical area or stage of technology readiness. Market factors, such as competing firms, resource supply chains, and level of demand are critically analyzed. Financial information and project financing is addressed (e.g. the system development cost or cost per tonne of CO2 mitigated.)</p> | <p>the technology is presented, including some information on the level of deployment or stage of technology readiness. The market for the technology is described in some detail. Financial information is presented (e.g. the the cost per system or cost per tonne of CO2 mitigated.)</p> | <p>the technology is presented but lacks completeness or accuracy. The level of deployment or stage of technology readiness is misrepresented. Incomplete analysis of the market for the technology is described. Financial analysis of the technology is incomplete or inaccurate.</p> | <p>is insufficient to describe economic case for the technology. The level or deployment or stage of technology readiness is not addressed. Inaccurate description of the market. Financial information is not presented.</p> |
|---|--|---|---|

**Policy Connections:** \_\_\_\_\_/10

| <b>10<br/>Exceeds<br/>Expectations</b>  | <b>6<br/>Meets Expectations</b>   | <b>4<br/>Partially Meets<br/>Expectations</b>  | <b>1<br/>Does Not Meet<br/>Expectations</b>   |
|---|---|--|---|
| <p>Clear and complete description of one or more policies relevant to advancing the technology are presented. Policies are critically analyzed with reference to the technology, economics, social and environmental impacts, and themes from earlier in the class. Requirements of the political system are addressed. Examples of existing policies are</p> | <p>One or more policies relevant to advancing the technology are described. An attempt is given to critically analyze the policies and their potential upsides / roadblocks. Requirements of the political system are addressed. Examples of existing policies are presented.</p> | <p>At least one policy relevant to advancing the technology is presented, but the description lacks clarity. No critical analysis of the policy is given. Requirements of the political system are not adequately presented. Examples of existing policy are incomplete or inaccurate.</p> | <p>Policies for advancing the technology are not presented, or lack accuracy. No critical analysis of policy is given. Requirements of the political system are not addressed. Examples of existing policy are not presented.</p> |

|                                    |  |  |  |
|------------------------------------|--|--|--|
| presented and critically analyzed. |  |  |  |
|------------------------------------|--|--|--|

**Presentation Delivery :** \_\_\_\_\_/5

| <b>5<br/>Exceeds<br/>Expectations</b>                   | <b>3.5<br/>Meets Expectations</b>         | <b>2<br/>Partially Meets<br/>Expectations</b> | <b>1<br/>Does Not Meet<br/>Expectations</b>          |
|---|---|---|--|
| Excellent presentation voice, eye contact, and visuals. | Great presentation voice and eye contact. | Presenter(s) seem unconfident/not practiced.  | Presentation was chaotic/did not fill up class time. |

**Class Engagement and Discussion Facilitation:** \_\_\_\_\_/5

| <b>5<br/>Exceeds<br/>Expectations</b>   | <b>3.5<br/>Meets Expectations</b>  | <b>2<br/>Partially Meets<br/>Expectations</b>                                 | <b>1<br/>Does Not Meet<br/>Expectations</b> |
|---|--|---|---|
| The discussion/class activity are innovative and the presenter(s) offer great opportunities for bridging thought. | The discussion/class activity are engaging and the facilitator asks appropriate prompting questions to engage thought. | The discussion/class activity provides relatively few learning opportunities. | There is no discussion/class activity.      |

**References and Strength of Evidence:** \_\_\_\_\_/5

| <b>5<br/>Exceeds<br/>Expectations</b>  | <b>3.5<br/>Meets Expectations</b>        | <b>2<br/>Partially Meets<br/>Expectations</b> | <b>1<br/>Does Not Meet<br/>Expectations</b> |
|--|--|---|---|
| More than 5 credible or academic sources with citations for images and graphs. | At least 4 credible or academic sources. | Less than 3 credible or academic sources.     | No references.                              |