* What ethical concerns, if any, may arrive as you consider your problem statement?
  + Ethical concerns that arise are CO2 emissions in regard to Global Warming. This affects the entire world to sustain the planet. Utilizing advanced technology like TPVs, we can mitigate the effects of global warming.
  + Incorrectly predicting emission trends at each site. This will have negative effects on our customers because they may have to pay more on carbon tax
  + Incorrectly judging our electrical rate advantage over industrial rates could lead to our customers paying more than their best bet.
  + The effect of incorrect CO2 predictions could adversely affect our company culture - in that we would operate on the premise of an unrealistic emission and potential emission mitigation scenario. This could trouble our employees and adversely affect their income if decisions made on our predictions negatively impact our revenue.
* Who might be affected?
  + Our customers
    - The effect of our algorithm predicting carbon emission trends at each float line may overestimate or underestimate the true emissions.
    - Overestimating will result in falsely optimistic forecasts on our revenue and could lead us to integrate more costly systems with our customers paying for the hardware upfront. This would predict an incorrect payback period on the customer’s investment and consequently return to them less over the described period.
    - Underestimating will result in falsely pessimistic forecasts which would lead us to adopt a more risk-averse approach to implementing our system. We might implement a more cost-effective system that trades performance for a lower payback period as described to your customers. Our customer would then break even within a shorter period as described and generate less profit past break even.
  + Our employees
    - Our employees stand to lose from incorrect predictions from our algorithms. Incorrect electrical rate advantage predictions and incorrect carbon emission predictions would lower our profit, given our revenue is dependent on our customers’ proven cost savings.
    - Lower revenue to our company from inaccurate customer cost savings would adversely affect our reputation and our ability to gain more clients. This would result in lower future profits and potentially the inability to pay salaries. In the worst-case scenario, we would have to terminate certain positions and layoff employees to meet our margin requirements.
  + Electricity companies
    - By predicting what the electric input would be needed for the power plants where we implement our technology. If predicted wrong we might need to pay for more power than we are taking from the grid.
* Do your conclusions warrant any ethical considerations?
  + Our conclusions warrant ethical considerations on future carbon emissions and electrical rates.
    - Unrealistic optimism or pessimism in our forecasts negatively affects our company and our customers. If your conclusions are purely based on uncertain data and we do not take the uncertainty into account when making future decisions, we will decrease the company profit, destroy the company reputation, fail to deliver returns to our stakeholders and fail to pay our employees the agreed-upon wages.
* How might your model be abused by a bad-faith actor?
  + Our data will not be abused. There is no incentive to use our predictions on carbon emissions or electrical rates, as they would likely fit within the category of all predictions related to these parameters. As such, they would present no advantage to bad-faith actors for abuse beyond other predictions that exist and are based on more rigorous analyses.
* Are there risks of bias in your data, model, or approach? List them.
  + Incorrect trend predictions
    - CO2
    - Electricity
  + Our product efficiency
* How would you address the bias present in your model?
  + Valid data sets
    - Training set, testing set for data
  + Research