CIVL 250 Midterm 18W SOLUTIONS

Q26 (5 marks)

Ranking should be from most broad concepts to most specific concepts. The most specific concepts are likely examples. The best lists will have no more than 2 or 3 concepts at the broadest rank, 2 or 3 concept at the slightly more specific rank, and perhaps 3 or 4 concepts at the more specific ranks.

Simple
Complex
Sub systems
Elements
Relationships
Behaviour
Self-organizing
Open/Closed
Feedback loops
Predictable/unpredictable
Emergent qualities
Examples of complex systems: Families/ecosystems/other examples
Examples of emergent qualities: human personality / the straight lines of ants exhibited by ant colonies (that lead to a food source) / bird flocking

Other concepts are possible – they should all lead to a description of a complex system.

Q27 (10 marks)

Read the following opinion editorial (op-ed) and analyze the piece in terms of its argumentation elements.

In the essay space below, please provide the following:

1. Tell us what you think is the main claim of the op-ed.
2. Describe one reason provided in the OP-ED that supports the main claim you have identified.
3. Does the author provide evidence in support of the reason you describe? If so, what is the evidence?
4. Identify one underlying assumption in this OP-ED.

OP-ED: BC's approved LNG Canada project will help reduce global emissions

With the recent announcement of LNG Canada's $40 billion project moving forward, many, particularly Green politicians, environmentalists, and fellow concerned sustainability advocates, have questioned whether Canada, or British Columbia, will be able to meet our greenhouse gas emission reduction targets.

The simple answer is yes.

The emission targets that both the province and the federal government have set are part of our Nationally Determined Contributions (NDCs) that were submitted to the United Nations' Climate Change body when Canada signed onto the Paris Agreement.

The agreement, the first-ever legally binding global agreement to combat climate change, finalized in 2015, provides a framework for countries to collectively reduce greenhouse gas emissions to a level which limits global rise in temperature to 1.5°C.

Now, how could we possibly reach our emission reduction targets when we're about to add an estimated 3.45 million tonnes of emissions to our current output?

Another simple answer is China, and the Paris Agreement itself.

Under the Paris Agreement, in Article 6, parties (countries), through cooperation both at the government and even the private-sector levels, can receive credit toward their reduction targets (NDCs) for emissions mitigation.

What does that mean and how is that all connected?

Essentially, with China rapidly moving to cut coal power consumption across the country, shifting to sources such as natural gas power plants, Canada could receive credit for assisting with the overall emissions reduction worldwide.

China plans to cut coal consumption by more than 10% by 2020, which will require a large amount of alternative energy sources, including natural gas.

It is estimated that natural gas power plants emit 50-60% fewer emissions than coal power plants, and China has already been identified as a major market opportunity by LNG Canada and government representatives.

So, despite adding nearly 3.5 million tonnes in new emissions to our annual output of roughly 61.5 million tonnes, we will most likely still meet our international commitments for emission reductions under the Paris Agreement.

This fact was probably one of the reasons why the Government of British Columbia provided an exemption to the carbon tax for the project.

Of course, both the provincial and federal governments will continue to push forward other measures and strategies to reduce our emissions at home, and will definitely expect British Columbians to play a key part in that.

In fact, our own personal consumption habits collectively in British Columbia amass more emissions and waste than our current oil and gas sector. The amount of waste, particularly plastic waste, and the overall consumption of beef, pork, and seafood, or the amount of water that is wasted in the production of craft beer and cotton t-shirts is immense.

Now, should our Green politicians, environmentalists, sustainability advocates, and concerned citizens relax and support the project?

I would suggest yes, and no.

British Columbians can recognize that we are part of a global community, and that collectively, through collaboration, we can reduce the global greenhouse gas emissions, and combat climate change. We will also see an estimated $500 million per year added to the local economy for decades, and an uptick in annual revenue for the provincial government that can support green projects.

However, we should be very concerned with the impacts on northern shipping routes, the amount of water and chemicals used to extract natural gas from the ground through the process called 'fracking,' and the potential increased demand on our hydroelectric system.

Written by Justin Kaiser, the founder and principal of [Climate Digital](#), a Vancouver-based sustainability consulting firm. He formerly participated in the 2015 UN Climate Change Paris Summit.

1. Tell us what you think is the main claim of the op-ed. (2 marks)
   a) Primary Claim: Canada and British Columbia will be able to meet our greenhouse gas emission reduction targets even with the construction of LNG Canada's project in Kitimat B.C.

      - *The claim of the OP Ed is highlighted in yellow*
      - *As part of the claim, the student should mention Canada's and/or B.C.'s GHG targets.*
      - *As part of the claim, the student should mention the Kitimat LNG project.*
      - *The claim of the article is NOT about China reducing its GHG emissions.*

2. Describe one reason provided in the OP-ED that supports the main claim you have identified. (2 marks)
   a) Reason: The UN Paris Agreement allows for countries who assist in reducing overall GHG emissions worldwide to receive GHG

credits. Therefore, by selling CH4 to China and thereby helping China reduce its GHG emissions, Canada will receive sufficient GHG credits that will "cover" our estimated annual increase of 3.5 million tonnes of CO2e which will result from the operations of Kitimat's new LNG plant.

- *The link between the Paris Agreement, overall GHG emissions worldwide, Canada selling CH4 to China, and being able to meet Targets needs to be made.*

3. Does the author provide evidence in support of the reason you describe? If so, what is the evidence? (4 marks)
    a) Evidence: CH4-fuelled power plants emit 50 to 60% less CO2e than coal-fuelled power plants, and China plans to reduce its GHG emissions by more than 10% via shifting from coal-fired power plants to natural gas fired plants. Therefore, the new Kitimat LNG plant will export LNG to China, to be used in China's new NG-fired power plants, thereby contributing to the reduction of GHG emissions worldwide.

    - *The student should compare the GHG output of CH4-fuelled plants vs coal-fuelled plants. (If a student compares the plants AND also the supply chain (i.e. consideration of GHG emissions associated with getting coal to the plant and the GHG emissions of getting the natural gas to the plant, then consider awarding a bonus point!)*
    - *The evidence supporting the idea that China will reduce its GHGs by shifting from coal to CH4 as a fuel in power plants needs to be mentioned*

4. Identify one underlying assumption in this OP-ED. (2 marks)
    a) Underlying Assumption: Without the Canadian supply of LNG, China's GHG emissions will not be reduced.

    - *A second underlying assumption may be that the author is assuming the GHG emissions of transporting the respective fuels to the plants are similar*
    - *Other underlying assumptions may be suggested. Please use your best judgement.*