

# Determining Sustainability of Technologies

## Checklist Instructions

**step 1:** Write the name of the energy technology you will be evaluating.

**step 2:** Apply a weighting for each type of sustainability—ecological, societal, and economic—based on its relative importance. Record these values in the first column of the checklist. **Note:** The weightings for all three categories should add up to 100.

**step 3:** Read the focus question and specific indicators for each type of sustainability in the second column of the checklist. Score the energy technology against each specific indicator listed as follows:

- Statements deemed true receive a score of 2.
- Statements deemed false receive a score of 0.
- Statements deemed uncertain (neither completely true nor false) receive a score of 1.

Record these scores in the third column of the checklist.

**step 4:** Add the scores of the specific indicators to obtain a total score, and record it in the appropriate space in the checklist.

**step 5:** Calculate the percentage for each type of sustainability using the formula given in the checklist. Record this value in the appropriate place.

**step 6:** Calculate a weighted score for each type of sustainability by multiplying the percentage score calculated in step 5 by the weighting for the type of sustainability determined in step 2.

**step 7:** Calculate the overall score of the technology using the formula given in the checklist. Record this value in the appropriate place.

**step 8:** Review the values calculated in steps 4, 5, and 7, and write a brief summary of your assessment. Include reasons for the scores provided against difficult criteria and for your overall assessment of the sustainability of this energy technology.

**step 9:** Compare your results with those of other students. Account for any similarities and differences.

# Determining Sustainability of Technologies

## Checklist

TECHNOLOGY:			
Type of Sustainability	Criteria	Score	
<b>Ecological Sustainability</b> Weighting = ____	<b>Focus Question:</b> Does the use of the technology protect resources (e.g., water, land, air, and biodiversity)? <b>Specific Indicators:</b> This technology...	True = 2 Uncertain = 1 False = 0	
	...is based on a renewable energy resource		
	...maintains the quantity of surface water		
	...maintains the quality of surface water		
	...does not contribute to acid deposition		
	...does not contribute to the presence of persistent organic pollutants in water, soil, or air		
	...does not contribute to the presence of heavy metals in water, soil, or air		
	...recycles liquid and/or solid waste products		
	...does not contribute to deforestation or habitat destruction		
	...does not contribute to greenhouse gas emissions		
	...does not contribute to emissions of ozone-depleting materials		
	...does not contribute to emissions of particulate matter		
	...does not contribute to photochemical smog		
	...does not threaten the survival of species at risk		
	...does not contribute to the destruction of fragile ecosystems		
	...does not contribute to the release of ionizing radiation		
	...does not contribute to the mass of radioactive waste produced		
	<b>Total Ecological Indicators</b>		
	<b>Percentage (total indicators ÷ 32 × 100%)</b>		
	<b>Weighted Score (percentage × weighting)</b>		

<b>Societal Sustainability</b> Weighting = ____	<b>Focus Question:</b> Does the use of the technology promote improved human health, education and opportunities for training, standard of living, and respect for diversity of cultural values within society?  <b>Specific Indicators:</b> This technology...	<b>True = 2</b> <b>Uncertain = 1</b> <b>False = 0</b>
	...does not decrease life expectancy through exposure to pollution	
	...stimulates a healthy economy, enabling adequate health care	
	...requires a highly trained workforce	
	...requires the workforce to adapt to change through continuous training	
	...reduces excessive land use (e.g., urban sprawl)	
	...encourages per capita energy consumption to be reduced	
	...stimulates a healthy economy, enabling affordable housing	
	...requires co-operation of diverse cultural groups in decision making	
	<b>Total Societal Sustainability</b>	
	<b>Percentage (total indicators ÷ 16 × 100%)</b>	
	<b>Weighted Score (percentage × weighting)</b>	
	<b>Economic Sustainability</b> Weighting = ____	<b>Focus Question:</b> Does the use of the technology result in greater opportunities for employment, economic growth, increased GDP, and optimum locations and scheduling for production?  <b>Specific Indicators:</b> This technology...
...supports full-time employment for the population		
...enables a higher proportion of the workforce to be paid reasonable wages		
...has a relatively low cost per megajoule (MJ)		
...enables development of other industry or opportunity		
...reduces the import of energy, contributing positively to the GDP		
...enables the export of energy, contributing positively to the GDP		
...can be used in a variety of locations that are well-suited to industry		
...allows for continuous, around-the-clock production		
...does not decrease the availability of natural resources		
<b>Total Economic Sustainability</b>		
<b>Percentage (total indicators ÷ 18 × 100%)</b>		
<b>Weighted Score (percentage × weighting)</b>		

**Overall Score for Technology (Ecological + Societal + Economic)**

## **Overall Assessment of the Sustainability for this Energy Technology**

### **Communication and Teamwork**

Compare your assessment of sustainability with those of other students. Account for any similarities and differences.