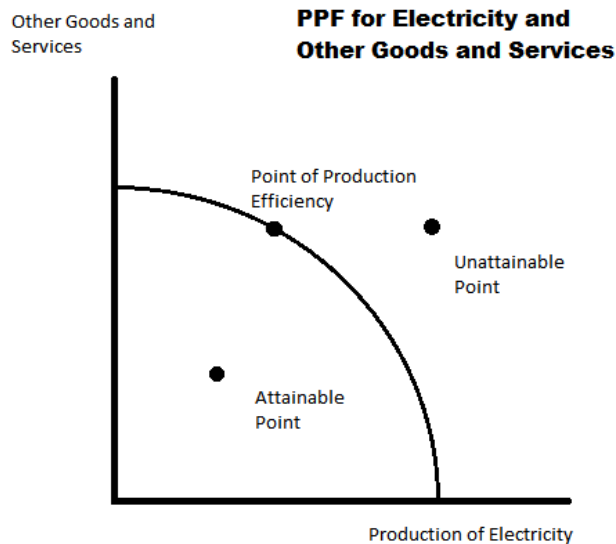


ECON 1021A Quiz 1 Suggested Solutions

1. Draw a PPF diagram with electricity production on the x-axis and all other goods and services on the y-axis. Make your PPF consistent with the principle of increasing opportunity cost. Label your diagram clearly.
2. Draw a point on your diagram that shows a combination of electricity and other goods and services which is attainable. Draw a point on your diagram that shows a combination that is unattainable.
3. Draw a point of production efficiency on your diagram.

All the points are clearly labeled on the following graph. Note that the PPF is **not** a straight line as its curvature is consistent with increasing opportunity costs.



4. What can you say about the allocative efficiency of the point you have drawn?

Allocative efficiency is achieved when both of the following conditions are achieved:

- Goods and services are produced at the lowest possible cost i. e. the point is located on the PPF;
- We cannot produce more of one good without giving up some other good which provides greater benefit i. e. we are at a point where the marginal cost is equal to the marginal benefit.

While the first condition is attained as we have achieved production efficiency, we are not able to say anything more as we do not have any information about the marginal benefit curve.

5. *Given the PPF you have drawn, is the marginal cost curve associated with it upward sloping or a horizontal line? Explain.*

The marginal cost curve in this case is upward sloping.

The marginal cost is the opportunity cost of an additional unit of good or service produced. As the PPF we were asked to draw exhibits increasing opportunity cost, the marginal cost increases as more electricity is produced. Therefore, we have an upward sloping MC curve.

Note that the horizontal MC curve is associated with constant marginal cost and a linear PPF.

6. *Looking at the costs of production of electricity both in the news clip and in the graph, what can you say about production efficiency? Which technology is efficient and why?*

Production efficiency is associated with production at the lowest possible cost. Oil, gas, and coal are associated with higher costs per kilowatt-hour than nuclear power. Note that wind-produced electricity is competitive only with gas and coal-based electricity, and, therefore, has a higher cost than nuclear energy.

So, production efficiency is attained by using nuclear power at the cost of 2 cents per kilowatt-hour.

7. *Where in your PPF graph are the inefficient technologies? How does the opportunity cost of producing electricity change in moving from wind to nuclear? How does the opportunity cost of producing other goods and services change?*

The inefficient technologies (oil, gas, coal, and wind) will lie within the space bounded by the PPF curve (the attainable points with the exception of the frontier itself).

As we move from wind (an inefficient technology) to nuclear (the currently most efficient available technology) the opportunity cost of producing more electricity decreases. Due to the new efficient technology we have to give up less goods and services for an additional kilowatt-hour of electricity.

As the opportunity cost of goods and services is reciprocal to that of electricity at the given point, the opportunity cost of goods and services will increase. We now will have to

give up more kilowatt-hours for some fixed amount of goods.