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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2021

Program: MA Energy Economics	Semester – IV
Subject (Course): Renewable Energy & Energy Efficiency Eco	Max. Marks: 100
Course Code : ECON 8004	Duration: 3 hrs
No. of page/s: 4	

SECTION A

1. Each Question will carry 5 Marks

2. Attempt all Questions

		Mar ks	CO
Q 1	Complete the Abbreviations 1. IRR 2. CUF 3. CERC 4. DSM 5. KW	5	CO1
Q2	On which factors wind power depends upon?	5	CO1
Q3	What are the financial instruments available that help us to finance green energy project?	5	CO1
Q4	Name 5 units of energy.	5	CO1
Q5	Name any 5 methods which Utilities can adopt to achieve Load Management	5	CO2
Q6	What are the types of solar radiation that are useful to generate Solar Energy?	5	CO2

SECTION B

1. Each question will carry 10 marks

2. Instruction: Write short / brief notes

Q7	Give some examples of Energy storage technologies. Which type of energy storage technology India should promote and why?	10	CO2
Q8	In order to meet emission reductions requirements, you argue that we must reduce electricity demand along with transitioning to low- and zero-carbon sources. How important is reducing demand in comparison to implementing renewables? Explain.	10	CO3
Q9	Explain the process of waste to energy as a part of Urban Waste Management project Or	10	CO3

	Critically analyze the economic evaluation of Solar rooftop PV integration for an ordinary home.		
Q10	Explain the financial parameters that have to be considered for calculating Renewable energy tariff. (Consider Project specific tariff and Generic tariff)	10	CO2
Q11	What is Demand Side Management? What is the role of EESL in achieving Demand Side Management?	10	CO3

SECTION-D

- 1. Each Question carries 20 Marks.**
2. Instruction: Write long answer.

Q12	<p>Despite green pledges, Amazon's carbon footprint grew 15 per cent</p> <p>Amazon.com Inc.'s sustainability report released this summer revealed a sharp year-over-year increase in global greenhouse gas emissions even as the company commits to shrink its carbon footprint.</p> <p>Environmental experts and climate-focused investor groups credit the e-commerce giant for its transparency but say the trend was in the wrong direction and needs to be addressed.</p> <p>In June, Amazon self-published its carbon footprint, saying its business operations emitted the equivalent of 51.17 million metric tons of carbon dioxide, a 15% jump from 44.4 million metric tons in 2018. The company did not explicitly state the cause of the increase, but acknowledged that it is in "high growth mode." The data includes Amazon's emissions from direct operations, purchased electricity and indirect sources such as third-party transportation, packaging, business travel and customer trips to physical stores of Whole Foods Market Inc., Amazon's grocery arm.</p> <p>Experts say Amazon's move to release the data is significant because it provides investors with insight into the carbon footprint of a company that has been silent for years about its environmental impact.</p> <p>"Amazon has showed it's woken up and it's listening and taking action in ways that investors have been asking for," said Lila Holzman, energy program manager for As You Sow, an advocacy group for shareholders of companies including Amazon. "We hope that continues."</p> <p>That said, Holzman's group and others remain concerned about whether Amazon will achieve its 2019 Climate Pledge commitment to become carbon neutral by 2040 and meet the goals of the 2016 Paris Agreement on climate change a decade early.</p>	20	CO4
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An Amazon spokesperson said in an email to S&P Global Market Intelligence that the company will continue to measure and report its total impact on the climate in the coming years, map the largest activities contributing to the impact, and use that data to develop carbon reduction goals, including its Climate Pledge.

Through the Climate Pledge, Amazon is investing in a range of large-scale solutions to decarbonize its business, but the company spokesperson noted it will take "several years for the carbon reduction benefits of these investments to be fully reflected in our carbon footprint."

Some observers are skeptical that Amazon can meet its Climate Pledge goals given its increase in carbon emissions. "They are really putting themselves out there to do this," Andrea Ranger, shareholder advocate with Boston-based Green Century Capital Management, said in an interview. "I think the takeaway is that it's very important that they have made this commitment, and that they are standing behind it."

Although its emissions have increased, Amazon is outperforming its peers when it comes to environmental disclosures, according to Trucost data for 2018, the most recent year available. Trucost is a part of S&P Global Market Intelligence that measures how transparent U.S. companies are being about their operational environmental and climate change-related risks through the lens of weighted disclosure ratios. Trucost gave Amazon a weighted environmental disclosure ratio of 72% for 2018, which is based on "Scope 1" data related to the company's direct operations such as the fuel burned by Amazon's delivery trucks.

Amazon declined to comment on that ratio but the company outperformed its peers including Chinese e-commerce companies JD.com Inc. and Alibaba Group Holding Ltd., as well as multiplatform retailer Qurate Retail Inc., all of which received disclosure ratios of 0 from Trucost for 2018. Booking Holdings Inc. received a disclosure score of 8% that year. JD, Qurate Retail, and Booking did not respond to inquiries seeking comment.

Alibaba declined to comment but in its 2018 ESG report the company said it is focused on several environmental efforts, including making its data centers more environmentally friendly by switching to cooling and water-efficient systems and working to replace packaging materials on Alibaba-related platforms with eco-friendly or biodegradable alternatives.

While Amazon is certainly making strides, the online retailer "is still relatively early in its journey" with regard to disclosing environmental information, said Trucost Head of Data Strategy and Operations James Salo. That said, Salo does expect Amazon to provide more disclosures of its carbon footprint in the coming years. "For companies of that scale, it's more surprising when they don't disclose," he said.

Amazon's growing carbon footprint coincides with the company's increasing scope of energy-consuming businesses. In addition to its online operations, Amazon is one of the world's largest logistics companies, relying on a vast network of fulfillment facilities to provide speedy delivery services, while its cloud computing unit, Amazon Web Services Inc., operates data centers worldwide. Amazon also runs more than 500 Whole Foods stores in North America and the United Kingdom. Construction is also well underway for Amazon's 4 million-square-foot second headquarters in Arlington, Va. Despite Amazon's increased transparency, stakeholders still have questions about how the company will meet its long-term climate goals and whether the company will provide more detailed information about its carbon footprint.

The Principles for Responsible Investment believes that steps Amazon has taken thus far are helpful, but feels the company "could go deeper, for example, in terms of greater transparency in their reporting on emissions," said CEO Fiona Reynolds. PRI is an international network of investors collectively managing about \$90 trillion in assets who have agreed to apply six sustainability principles to their investment decisions.

Holzman, of As You Sow, wants to see Amazon report more details about its "Scope 3" emissions from its supply chain, including activities related to its third-party sellers. Scope 3 emissions include activities that take place beyond a company's direct operations, like the production of Amazon packaging and devices, while Scope 2 emissions focus on purchased electricity.

And Ranger of Green Century Capital Management said her group wants to know more about the concrete steps Amazon is taking with initiatives like its "Shipment Zero" goal to eventually achieve net zero carbon emissions tied to shipping goods to consumers. "Amazon will do well to have people look under the hood as clearly and as transparently as possible," Ranger said.

1. What are the steps Amazon taking to reduce carbon foot print? (10)

2. What Further steps Amazon can take to reduce their carbon foot print? (10)