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Accounting Carbon Footprint Of Civitas Academica The Polytechnic Of Accounting Pontianak (Cost Correlation Emissions)

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Abstract
*Climate change destructive impact on many sectors. One of these is the economic stability, a lifestyle change and transformation economic, political, social and cultural trigger friday as derived from the emission of greenhouse gases in the earth. People have a tendency to a consumption more than usual if threatened in a temperature of hot, hungry and thirsty and desire for comfortable, drive a car, or using air conditioning. Accounting carbon footprint to be that important to observed as early as a sign of sensitivity to the issue of climate change are now global issues. The carbon footprint of the gap in Indonesia existing still use reference The ESDM ministry in 2016, only focused on primary just carbon footprint. Thus there is an important reason measuring accounting carbon footprint with reference scale an international unit version of the latest Climate Steward 2022. The purpose of this research to test the relationship between the costs and emissions. The methodology is survey, by spreading the questionnaire to academics from the polytechnic of Accounting Pontianak based on carbon footprint calculator. It contains a carbon footprint calculator individuals households, vehicles, public transportation, eat and drink and other expenditure that raises the cost of emissions. Population were 1.573 person academica who is a lecturer, tendik, and college students. Engineering the sample collection of clusters of random samples, divided into 4 cluster with a total sample 120 people chosen randomly. Data then tested with the correlation Pearson. The research results show there is a positive correlation between the costs and emissions by value ** 0,806 Pearson indicator. The total cost of the activity of individual academics in Indonesian Rupiah is Rp. 57.289.150 per week with the total emissions of 80.824 kgCO_2 per week , it means academics from release 80.824 kilograms of carbon dioxide into the air every weeks. These emissions find that women are the most costs and high yield of emissions. Costs and emissions was the largest by household activity. That is the high cost hence posed to the higher emissions. Accounting carbon footprint and the importance of sensitivity to the environment of the cost we push out. That should be provided by managing green issues.*
Keywords: *Carbon Footprint, Cost, Emissions*

1. INTRODUCTION

The impact of climate change is felt quite significant today, especially the environment., nature, And climates that can change so quickly. The chemical climate change is the release of Carbon Dioxides (CO2), Methane (CH4), Nitrogen Dioxide (N2O) into the air so these substances are the particles that cause global warming. Climate change has a destructive effect on many sectors. One of them is economic , a life tyle changes and economic transformations, politics, social and culturally established as triggers for increased emissions derived from earth's greenhouse gases. All activities good industry, deforestation, and men encountered carbon footprint left. Even most deforestation release CO2 into the atmosphere. Carbon footprint left for the temperature of the earth will have an impact, like global warming, flood, heat waves and other negative effects.

The variety of human activities contribute 1,1 degrees up to 5,4 degrees temperature (IESR,2022). In psychology, hot temperatures and influence the behavior by individuals and organization in life. People have a tendency to a consumption more than usual if threatened in a temperature of hot, hungry and thirsty and desire for comfortable, drive a car, or using air conditioning. Carbon footprint to be that important to early observed. These are the carbon footprint at that country in 2022, indeed the certainly of the confirmed there is increased in question.

Table 1. Individuals Emissions Footprint

Country	Emissions Average (Ton CO2e)
Global	4
United States	16
Indonesia	2,16

Source : IESR, 2022

The large countries such as the United States contributed the most carbon emissions in the world, while Indonesia is the greatest contributors to carbon emissions in southeast Asia, even been in the top 10 in the world carbon emissions. (Betahita, 2023). Indonesia produced average of emission carbon that is improving every year. The following data carbon emissions in Indonesia as follow

Table 2. Indonesian Average Emissions

Year	Average Emissions (billion Ton CO2e)
2021	2,01
2022	2,18
2023	3,58
2024	4.70

Source : Betahita, 2024

It is mentions that the average carbon emissions in Indonesia is increasing. Even in 2024 a significant rise was marked by sectors of emission such as the processing industry, power supply and gas supply, Transport, agriculture and waste management. Some of the current research has begun to focus on environmental issues such as carbon and emissions. Calculating or accounting carbon footprint will help individuals or groups and organizations to know the production of carbon emissions produced at a specific time or period. Carbon footprint will calculate the use of transportation and motor vehicles, electricity, gas or bio mass that we use, as well as foods that leave emissions and other potential spending to contribute carbon emissions. The carbon footprint of the gap in Indonesia existing still use reference The ESDM ministry in 2016, only focused on primary just carbon footprint. Thus there is an important reason measuring accounting carbon footprint with reference scale an international unit version of the latest Climate Steward (2022).

The carbon trace accounting known as the greenhouse gas account, is one way for both individuals and organizations to engage in the process of calculation., report and manage greenhouse emissions gases. Some of the previous studies showed CO2 emissions studies in the Sahid Jakarta, 2021 with a focus of observation on the use of electricity that affects the CO2 emissions. While the Amrizarois research, (2022) about the development of cell phone battery electrical technology reveals that the use of batteries is not environmentally friendly. Which distinguishes this research from the previous research lies in a feature of carbon emission assessment., Previous research only did an emission assessment with reference from the Ministry of ESDM, (2016), While this research completes the carbon footprint each individual is both primary and secondary, so that the total cost and emissions of carbon whose footprint is left by the individual can be known and studied. The purpose of this research to test the relationship between the costs and emissions. Emissions are counting by primary and secondary carbon footprint for each individual of Civitas Academica of The Polytechnic of Accounting Pontianak, Clustered by lecturers, tendik and students.

2. LITERATURE REVIEW

Carbon footprint is the sum total of carbon or emissions resulting from human activity at a particular time. They are not here to be counted first using a standard calculator specifically designed to consider the volume of emissions resulting from carbon footprint that individuals or organizations leave. Carbon footprint will be influenced by variety of human daily activities or organization.

That activity among others: 1) The use of a motor vehicle motor vehicles will be running because it is filled with fuel gasoline or diesel fuel, the evolutionary fossil fuels that began. The use of a motor vehicle or transportation vehicle personal carbon footprint will leave staff high if this got hemmed in vehicles. You can imagine how much carbon emissions is discharged into the air, and that happens every day. 2) Electricity consumption of electricity used in a variety of human activities have contributed the release of emissions into the air. Electricity available mostly comes from fossil fuels on a power station and can be in the form of electrical energy to light air conditioning, television, the house and the street lamps and lighting and other activities in the daily life. 3) The water before into clean water, water will be managed by first, whether through the process of distillation or process of sterilizing. 4) Food consumption carbon footprint left of consuming food not by trash from food wasted it, but started with how food is processed, distributed and consumed. The long stretches of the process and the distribution of food to contribute the emission and discharge into the air. Carbon footprint is divided into two groups namely carbon footprint primary and secondary carbon footprint Paulus, Ninin (2016)

2.1 Primary carbon footprint (Primary carbon footprint)

Activity that uses fossil fuels like coal, oil or natural gas in the form of the use of motor vehicles, airplane, Electrical energy and manufacturing industries are traces of primary carbon. Primary carbon footprint equals direct burning of fossil fuels.

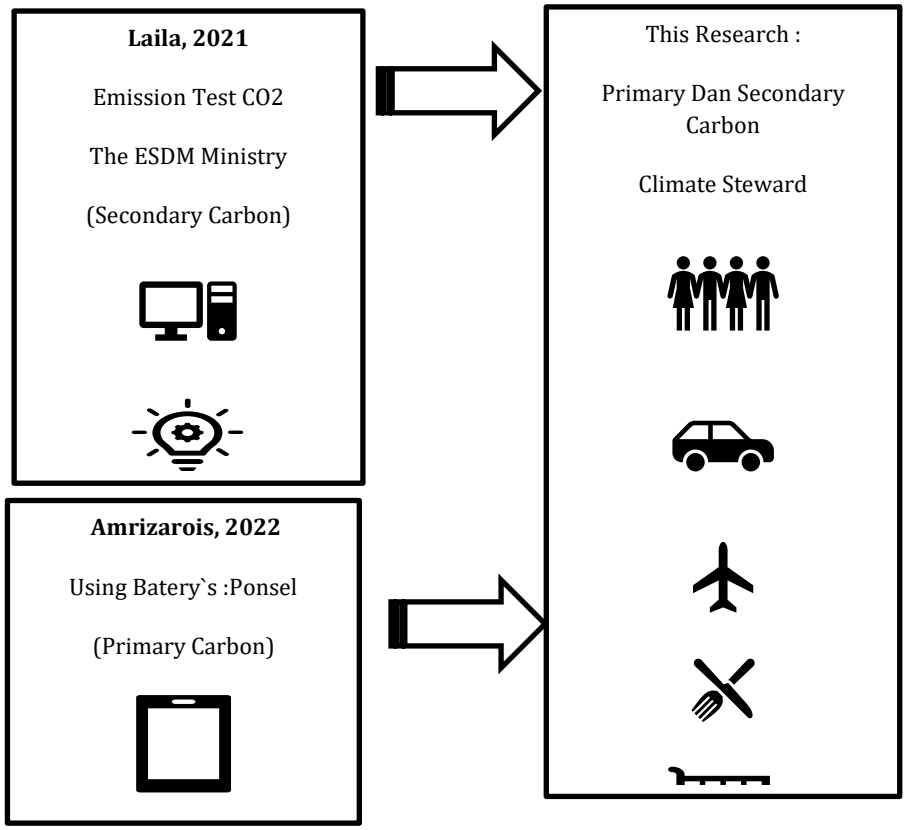
2.2 Secondary carbon footprint (secondary carbon footprint)

Process food processing and electronic equipment as a carbon emissions donor with an indirect category of carbon emissions recognized as a secondary carbon footprint. The consumption of goods and services begins from the product - making cycle, The processing is manufacturing., distribution gets to the consumer's hands like foods, and electronic devices like laptops, Cell phone, and other equipment used. Secondary carbon footprint is an indirect carbon emissions.

Accounting carbon footprint there are some way of numbering carbon footprint for both individuals and the organization. The following way of numbering: emission carbon footprints: 1) The study carbon footprint version of the ministry of energy and mineral resources, the calculation of carbon emissions with the secondary greenhouse gas emissions. 2) The study Climate Steward version carbon footprint, 2022, the calculation of carbon emissions primary and secondary in a calculator that contains the costs and emissions. The costs and emissions are included in the calculation is among others: the use of fuel in the craft, the use of private motor, car, or train, public transport, bus, ferry, flight, food etc. 3) The study carbon footprint imbangi version, the calculation of carbon emissions by 2023 special attention to forest conservation and environment especially to protect the forest. Data access is the duration of the use of equipment and electronic devices such as air conditioning, tv, radio, cell phones and other devices device. Any emission calculated will be given recommendations planting trees as plants in the environment. This means that after individuals to know how means the emission and individual unable to redeem or carbon offsetting carbon emissions by planting trees at a particular location. 4) The study carbon footprint version carbon ethics, the calculation of carbon emission based on the use of plastic, electricity, food and vehicles. 5) The study carbon footprint the program version 6) Carbon footprint.The study carbon footprint calculator hijauku version, the calculation of 2 categories counting energy consumption and co2 emission households and transport option.

Research development explain that previous research only focus in primary and secondary as a part. In this research mentions by mergering both primary and secondary in the same time by newest measurement based on Climate Steward (2022), carbon footprint.

Illustration 1. Research Development

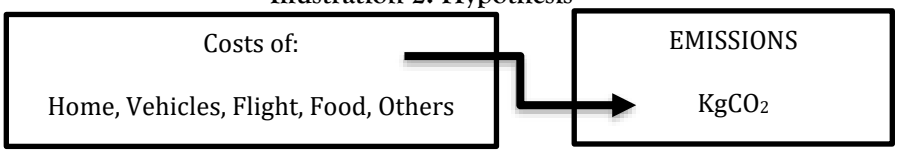


Source: data`s processed, 2025

Laila (2021) mentions secondary carbon footprint calculations on a college, It's an electrical calculation on campus. It's like air conditioners, computer, infocus measured. While Amrizarois (2022) also examined the primary carbon footprint due to cell phone battery use. The two previous studies only calculated the primary and secondary carbon footprint by the Ministry of ESDM (2016). When environmental issues require everyone's support today, then research in a more complete direction would be better if a secondary carbon footprint were to be judged. The development is to assess how emissions can cost on primary and secondary carbon footprint in the same time. They're both primary data so that both individuals and organizations are more sensitive to the concept of green to support the reduction of global emissions.

Hypothesis based on the frame of each variabel, how it can correlate if test is running. Cost maybe has a connection with emissions as well.

Illustration 2. Hypothesis



Source: data`s processed, 2025

H_0 = There is a positive connection between cost and emissions

3. METHOD

Methods used in this research is method of surveying. A method of surveying used to meet the contents of carbon footprint calculator, that could be met accounting calculated carbon footprint. Data from the sample population contains data carbon calculator used. The question is in default because carbon

footprint calculator standars of carbon footprint`s international climate belonging to Steward. The survey was conducted the Polytechnic of Accounting Pontianak, in all academic such as lecturer, tendik, and college students.
Population as known all civitas academica of the Polytechnic of Accounting Pontianak, it consist of 1.573 people. There are 4 majoring study in accounting department, finance accounting, accounting public sector, banking and finance digital, also taxations.

Table 3. Populations

	Person
Lecturers	40
Tendik	9
Students of D3 / AKK	559
Students of D4 / ASP	841
Students of D4 / PKD	51
Students of D4 / PJK	73
Total Populations	1.573

Source: data`s processed, 2025

This research sample uses a cluster random sample, which is a sample grouped in clusters. Then a randomly selected cluster, as for randomly selected clusters on a set of steps determines the random sample cluster 30 person for each cluster.
1. Population of 1.573 people of civitas academica
2. Determines cluster, which is to choose four clusters at random such as: lecturer, students of D3 accounting finance (AKK), students of D4 accounting public sector (ASP) and students of D4 banking and finance digital (PKD).
3. Of four select clusters then determined the number of clusters as many as 30 persons per cluster

Table 4. Sample

Clusters	**Person**
Lecturer	30
Students of D3 / AKK	30
Students of D4 / ASP	30
Students of D4 / PKD	30
Total Sampels	120

Source: data`s processed, 2025

Analysis the beginning data start at carbon calculator, every respondens are full fill the carbon form, it`s measure the weekly activity such as: home expenditures, vehicles, public transportation, flight, foods and others expenditures. Then total of cost and emission mentioned on its calculator, so cost and emissions would informed in the same time. The data sample tested in the correlation with employing correlation Pearson to see whereabouts of the connection between the costs and emissions.

4. RESULT AND DISCUSSION

There are 6 judgment is: households, vehicles, public transport, flight, foods and others.
The steps performed in the carbon footprint calculator are as follows:
1. Filling household activities such as gas and electricity use will be known carbon costs and emissions are generated.
2. Filling the vehicle activities, are motorcycles and cars with the type and type of fuel used. Vehicle usage activity will be known cost and carbon emissions are generated
3. Filling public transportation activities, use of public transportation such as buses, ferry crossing, train, The Public transportation use activity will be known what the cost and carbon emissions generated.
4. Filling the flight activity, How many times fly, between the following cities the distance will generate a large amount of costs and emissions.

5. Filling the eating activity, cost of eating with meat, fish, or vegetarian. Eating activity will be known cost and carbon emissions are generated.
6. Filling in other activities, like a salon, eat at the restaurant, pets, insurance, laundry and other will be known cost and carbon emissions are generated.

After the data included in carbon calculator, they shall be reported those costs and emissions produced by each individual in the same time. Following the example of the cost and the emissions of activities carried out by someone.

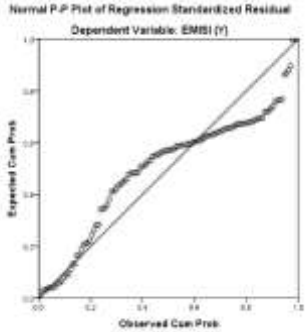
Illustration 3. Carbon Footprint Calculator

Source: Steward, 2022

The cluster of random sample of 120 people of civitas academica, consisting of 75 women and 45 men full fill the data as written on carbon footprint calculator revealed as the follows:
1. The total cost of the activity of individual academics in Indonesian Rupiah, IDR 57.289.150 per week, with the total emissions of 80.824 $KgCO_2$ per week, which means academics from release 80.824 kilograms of carbon dioxide into the air.
2. Women are the costs and high yield of emissions.
3. The largest household activity contributed the most cost and emissions in this research.

Normality Test intended to test data that normally distributed as one of term condition to start couple test. P Plot figure shown in following

Illustration 4. P-Plot Figure Normality



Source: data`s processed, 2025

Pictures show that P-Plot to scatter data near diagonal lines normally distributed.
Kolmogorof Smirnov test is intended to find that the data sample has distributed normally. One sample-KS used to read the normality test better than P-Plot test.

Table 5. Test Of Kolmogorov Smirnov

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		120
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	530.55460357
Most Extreme Differences	Absolute	.174
	Positive	.174
	Negative	-.136
Test Statistic		.174
Asymp. Sig. (2-tailed)		.669[c]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

Source: data`s processed, 2025

The results show that Asymp. Sig. (2-tailed) is 0.669 is normal scale of data on sample to alpa 0,05.
The correlation coefficient is to see the degree of closeness between variables specified with a value of correlation coefficient, cost and emissions.

Table 6. Test Of Pearson Correlation

Correlations			
		Cost (X)	Emissions (Y)
Cost (X)	Pearson Correlation	1	.806**
	Sig. (2-tailed)		.000
	N	120	120
Emission (Y)	Pearson Correlation	.806**	1
	Sig. (2-tailed)	.000	
	N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: data`s processed, 2025

Pearson correlation could be found several items of objective:

1. Based on the significance, If value of Sig.(2-tailed) < 0,05, it means there is a correlation between variables. The correlation in table above are sig.(2-tailed) shown that 0,000. These value full fill the terms below 0,05 alpha. H_0 of hypothesis is received. It means there is a positive correlation between cost and emission variable.
2. Based on the count of r Pearson correlation, if the r count value > r table distribution, indicate hence any correlation between variables. The table shows that r Pearson correlation is 0,806, while r table show that 120 sample with a significant degree at the level 5 % = 0,176. So that it can be concluded that there was a correlation between the costs and emissions.
3. Based on asterisk in output over the correlation Pearson SPSS (*) or (* *) show analyzed happened correlation between variables. The (* *) in table above shows a correlation between the costs and emissions.

5. CONCLUSION

Based on the results, conclusion of these research mentions as: The total cost of the activity of individual academics in Indonesian Rupiah is Rp. 57.289.150 per week with the total emissions of 80.824 $kgCO_2$ per week, it means academics from release 80.824 kilograms of carbon dioxide into the air every weeks. These emissions find out that women are the most costs and high yield emissions. Costs and emissions was the largest by household activity. Test of Pearson correlation shown there is a positive correlation between cost and emission variable in 0.806**. These asterisk symbol indicate a correlation too. Positively there is a correlation between the cost and emissions. If cost getting higher, also the emissions.

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