# AMD Ryzen™ Processor Efficiency Calculator

**Report Exported on :**

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**AMD Processor Efficiency Calculator is AMD Ryzen™ Power Efficiency Calculator and Greenhouse Gas Emissions Tool. This tool uses the various inputs selected or provided by the user on the CALCULATOR, to calculate estimates for power consumption based on processors selected and its greenhouse gas emissions.**

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# Processor Efficiency Calculator Report

## Summary:

This report compares estimated cost savings of the processors AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 and Intel Core i7-1280P HP EliteBook 840 G9 in the Best Power Efficiency OS Power Mode and for 8 working hours per day. It also provides the evaluation of greenhouse gas emissions potential savings and compares total kilowatts. It will guide you to discover the right processor for your business fleet and sustainability goals while calculating how far you can reduce your enterprise fleet's carbon footprint.

| Input Details | | | |
|---|---|---|---|
| **Selected AMD Processor** | **Selected OS power mode** | **Selected Intel Processor** | **Entered work hours per day** |
| AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 | Best Power Efficiency | Intel Core i7-1280P HP EliteBook 840 G9 | 8 |

## Processor Configuration :

| | Selected AMD Processor | Selected Intel Processor |
|---|---|---|
| **Processor Name** | AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 | Intel Core i7-1280P HP EliteBook 840 G9 |
| **System** | HP EliteBook 845 G10 | HP EliteBook 840 G9 |
| **RAM** | 2x16GB | 2 x 8GB |
| **Storage** | 512GB | 512GB |
| **OS** | Microsoft Windows 11 Pro | Microsoft Windows 11 Pro |
| **Graphics** | AMD Radeon™ 700M Graphics | Intel Iris Xe Graphics |
| **fullconfig** | System configuration for AMD Ryzen™ 7 PRO 7840U: HP EliteBook 845 G10, 2X16GB LPDDR5 5600MHz RAM, 512GB SSD, AMD Radeon™ 700M Graphics, Windows 11 Pro, 14" Display and uses default screen brightness. | System configuration for Intel Core i7-1280P: HP EliteBook 840 G9 2x8GB DDR5 4800 RAM, 512GB SSD, Intel Iris XE Graphics, Windows 11. |

# Part1 - Calculation and Comparison of System Energy Used Everyday

## Description :

In this part, the processor performance values, the OS power mode, and the number of hours the system used per day will be used to calculate and compare daily system power usage of both the AMD and Intel Systems.

| Processor Performance Values | | % Difference | |
|---|---|---|---|
| Selected AMD processor(wh) | Selected Intel processor(wh) | Intel /AMD | AMD /Intel |
| 127.44 | 286.48 | 124.79 | -55.51 |

## Claim 1 :

Compared to an AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10, a system with the Intel Core i7-1280P HP EliteBook 840 G9 consumes an estimated 124.79% more energy for typical office productivity and collaboration workloads over the course of a 8-hour workday

## Claim 2 :

Compared to an Intel Core i7-1280P HP EliteBook 840 G9, a system with the AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 consumes an estimated 55.51% less energy for typical office productivity and collaboration workloads over the course of a 8-hour workday

# Part 2 – Fleet energy usage

## Description :

This part is used to extrapolate the difference in energy used by the comparison processors across a fleet of size 25000 and lifecycle duration of 3 years. 260 working days is used as the model for one year.The output is the difference in system energy consumption in kilowatt hours for each processor selected in part 1, with the fleet scenario applied.

| Input Details | |
|---|---|
| **Fleet Size** | **Life Cycle Duration (Years)** |
| 25000 | 3 |

## Output :

| Total Fleet Energy | | |
|---|---|---|
| **Selected AMD Processor** | **Selected Intel Processor** | **Difference** |
| 2,485,080.00 | 5,586,270.38 | 3,101,190.38 |

## Claim :

Over the course of 3 year(s), a fleet size of 25000 systems with AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 consumes an estimated 3,101,190.38 kilowatt - hours less energy for typical office productivity and collaboration workloads compared to the Intel Core i7-1280P HP EliteBook 840 G9

# Part 3 – Calculation and Comparison of Cost Savings based on Fleet Location

## Description :

In this part, cost savings of operating a fleet of 25000 systems is determined and compared over their lifecycle duration of 3 years using the AMD processor and Intel processor. Countries and U.S. states are options for selection, with prices per kilowatt hour generated based on the selections made. Or the user may set their own energy price as a third option. Country Electricity prices for businesses per kWH posted in June 2023 and come from the Global Petrol Prices website at https://www.globalpetrolprices.com/electricity_prices/ . U.S.energy pricing is based on U.S.Energy Information Administration published state electricity profiles at https://www.eia.gov/electricity/state/. The currency exchange rate for US Dollar ($) is based on the exchange rate published at https://fiscaldata.treasury.gov/currency-exchange-rates-converter/.

| Input Details | | | |
|---|---|---|---|
| **Selected Currency** | **Selected Country** | **Selected State (US)** | **Enter your own cost per kWh ($)** |
| US Dollar ($) | United States of America | Texas | N/A |

## Output :

| Cost Savings From Fleet Energy Difference | | |
|---|---|---|
| **United States of America** | **Texas** | **Your location** |
| $ 455,874.9859 | $ 315,080.9426 | N/A |

## Claims for respective fleet locations :

| Fleet Location | Claim |
|---|---|
| United States of America | Operating a fleet of 25000 laptops powered by AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 processors instead of Intel Core i7-1280P HP EliteBook 840 G9 processors can save an estimated $ 455,874.9859 over a 3 year usage period |
| Texas | Operating a fleet of 25000 laptops powered by AMD Ryzen™ 7 PRO 7840U HP EliteBook 845 G10 processors instead of Intel Core i7-1280P HP EliteBook 840 G9 processors can save an estimated $ 315,080.9426 over a 3 year usage period |
| Your location | N/A |

# Part 4 – Conversion to Equivalent Greenhouse and Carbon Emission

## Description :

This part takes the fleet energy savings determined in PART 2 and uses calculations and references published in the Greenhouse Gas Equivalencies Calculator by the U.S. Environmental Protection Agency (EPA) to convert kilowatt hours of energy avoided into metric tons of CO2. See https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references for Greenhouse Gases Equivalencies Calculator - Calculations and References.

| EPA Conversion Factors | Metric Tons CO2 Equivalent | 2,198.744 |
|---|---|---|
| **Equivalent to GHG emissions from** | Gasoline-powered passenger vehicles driven for one year | 489.698 |
| | Miles driven by an average gasoline-powered passenger vehicle | 5,637,805.075 |
| **Equivalent to CO2 emissions from** | Gallons of gasoline consumed | 247,411.273 |
| | Gallons of diesel consumed | 215,986.638 |
| | Pounds of coal burned | 2,462,199.305 |
| | Tanker trucks' worth of gasoline | 29.107 |
| | Homes' energy use for one year | 277.269 |
| | Homes' electricity use for one year | 427.854 |
| | Railcars' worth of coal burned | 12.128 |
| | Barrels of oil consumed | 5,113.358 |
| | Propane cylinders used for home barbeques | 99,942.908 |
| | Coal-fired power plants in one year | 0.001 |
| | Natural gas-fired power plants in one year | 0.006 |
| | Number of smartphones charged | 267,487,102.119 |
| **Equivalent to greenhouse gas emissions avoided by** | Tons of waste recycled instead of landfilled | 760.811 |
| | Garbage trucks of waste recycled instead of landfilled | 108.687 |
| | Trash bags of waste recycled instead of landfilled | 95,183.722 |
| | Wind turbines running for a year | 0.598 |
| | Incandescent lamps switched to LEDs | 83,285.757 |
| **Equivalent to carbon sequestered by** | Tree seedlings grown for 10 years | 36,645.733 |
| | Acres of U.S. forests in one year | 2,617.552 |
| | Acres of U.S. forests preserved from conversion to cropland in one year | 14.582 |