36/100

Question :01

Please come to office hours so we can check in. -1

1 British Thermal Unit = 1 gigajoule

a) 257086 MBTU = 257086 GJ Look

1GJ = 1000 cubic feet of natural gas.

257086 GJ= 257086,000 cubic feet of natural gas

b) 1KWH = 3414 BTU

257086 MBTU = 75.30 KWH Work -1

c) 1 barrel of petroleum (bbl) = 42 US gallons = 0.159 m 3

1 joule (J) = 9.484×10 -4 British thermal units (Btu)

257086MBTU = 271240089 Joule -2

d) 1 Ton = 907.185 kg

271240089 joule = 0.064 ton ? -2

e) Metric ton of coal = 1234KG -2

f) 257086 GJ= 257086,000 cubic feet of natural gas -2

g) 1 Ton = 907.185 kg

Kilogram of nuclear fuel = 283.3KG -2

h) Let's assume that you want to install 10 solar panels rated at 100 Watts each and having a conversion efficiency of 18%. The total power output of the solar system can be calculated as:

Total Power Output=Total Area x Solar Irradiance x Conversion Efficiency

We know the required Total Output Power is 1000 Watts (10 panels x 100 Watts), the Solar Irradiance for a surface perpendicular to the Sun's rays at sea level on a clear day is about 1000 Watt/m2 and the Conversion Efficiency is 18%. Plugging these number in the above equation we get:

1000 Watts = Total Area x 1000 Watts/m2 x 0.18

This looks like an internet answer. -5

or Total Area = 5.56 m2

i) Baja Fresh currently has 162 restaurants, while La Salsa has 23 units - 3

j) The highest energy content fuel is **hydrogen**, which is also the simplest chemical component in existence.

of the ones you looked at

Question: 2

a) Total No of students = 40,000

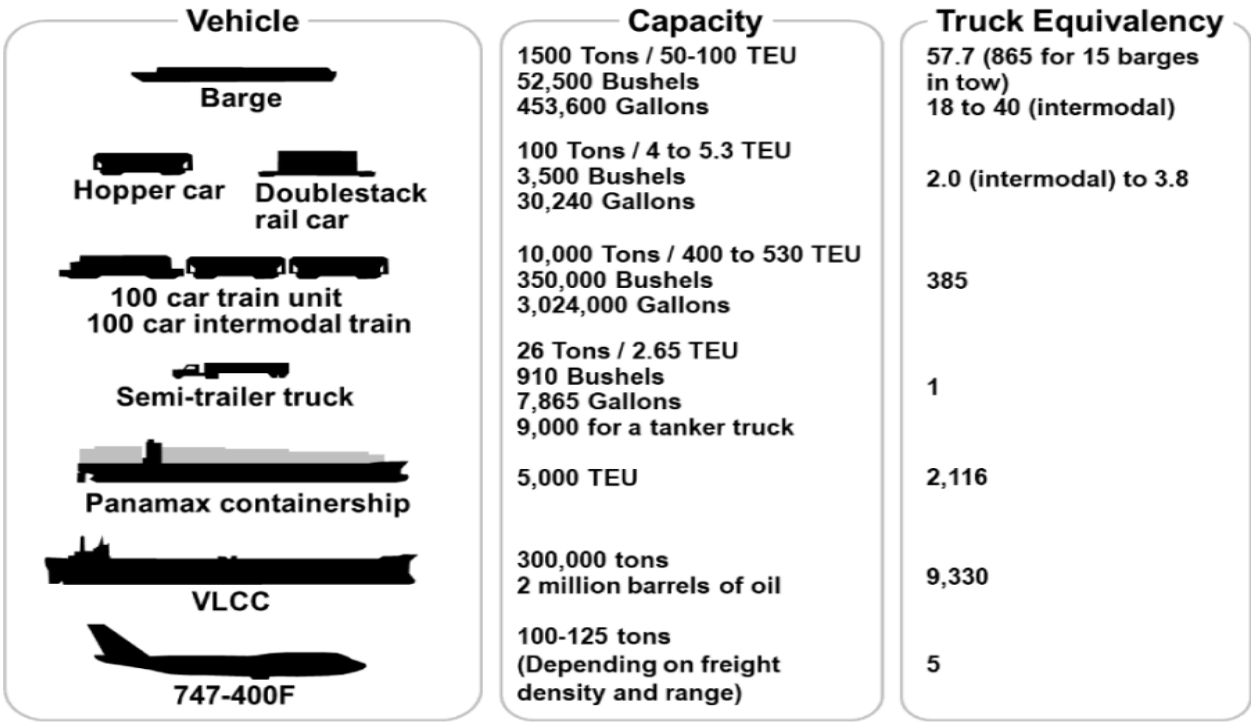
30000 students out of which 6 percent live on campus

6 Percent student which live on campus are 1800, 10,000 parking space on campus

Full-time equivalent of employees	1,860	1,801
Full-time equivalent of distance education students	9,532	12,372

Gasoline used per day = 123 Gallons

work? – 6



b) 123 Gallons = 16206480000 Joule

1GJ = 1000 cubic feet of natural gas.

16206480000 joule = 16.206 Giga Joule.

– 4

c) At the turn of the century, global emissions were roughly 23 billion metric tons, but by 2021 had reached a record high of 36.44 billion metric tons. & On weekly basis released metric ton of carbon is 7 metric tons. – 4

d) The world emits about 43 billion tons of CO2 a year .and the percentage becomes 5.66.

e) A carbon footprint is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions. The average carbon footprint for a person in the United States is **16 tons**, one of the highest rates in the world. Globally, the average is closer to 4 tons. – 3

f) Intervention to reduce emission include following:

Surgical Materials

Plagiarized – 10

Interventions for surgical materials include (M1) maximizing recycling, (M2) maximizing regulated medical waste, (M3) reusing cotton OR towels, (M4) switching to reusable gowns and drapes, (M5) maximizing use of SUD reprocessing by third-party reprocess or, (M6) using the essentials of surgical materials, and (M7) a combination of these material approaches. UPMC was sorting most of their surgical waste away from red bag or hazardous waste. At UPMC, nonhazardous, or white bag, waste is sent to a sanitary landfill, and regulated medical waste is autoclaved before landfilling, adding extra treatment and emissions to the end-of-life scenario. Reusable gowns and laparotomy drapes (M4) have an estimated life span of 75 uses and are sterilized between cases with laundering, drying, and autoclaving cycles, per manufacturer recommendations. A panel of 3 practicing gynecologists at UPMC determined a list of the essentials of surgery (M6); these include a uterine manipulator, a monopolar shears, a vessel sealer, a grasper, laparoscopic suturing equipment, suture, ports, and an insufflator. We calculated the environmental impacts from these single-use instruments using their purchase prices and the Economic Input Output Life Cycle Assessment database.

To reduce per student carbon footprint:

Choose organic and local foods that are in season. Transporting food from far away, whether by truck, ship, rail or plane, uses fossil fuels for fuel and for cooling to keep foods in transit from spoiling.

Buy foodstuffs in bulk when possible, using your own reusable container.

Reduce your food waste by planning meals ahead of time, freezing the excess and reusing leftovers.

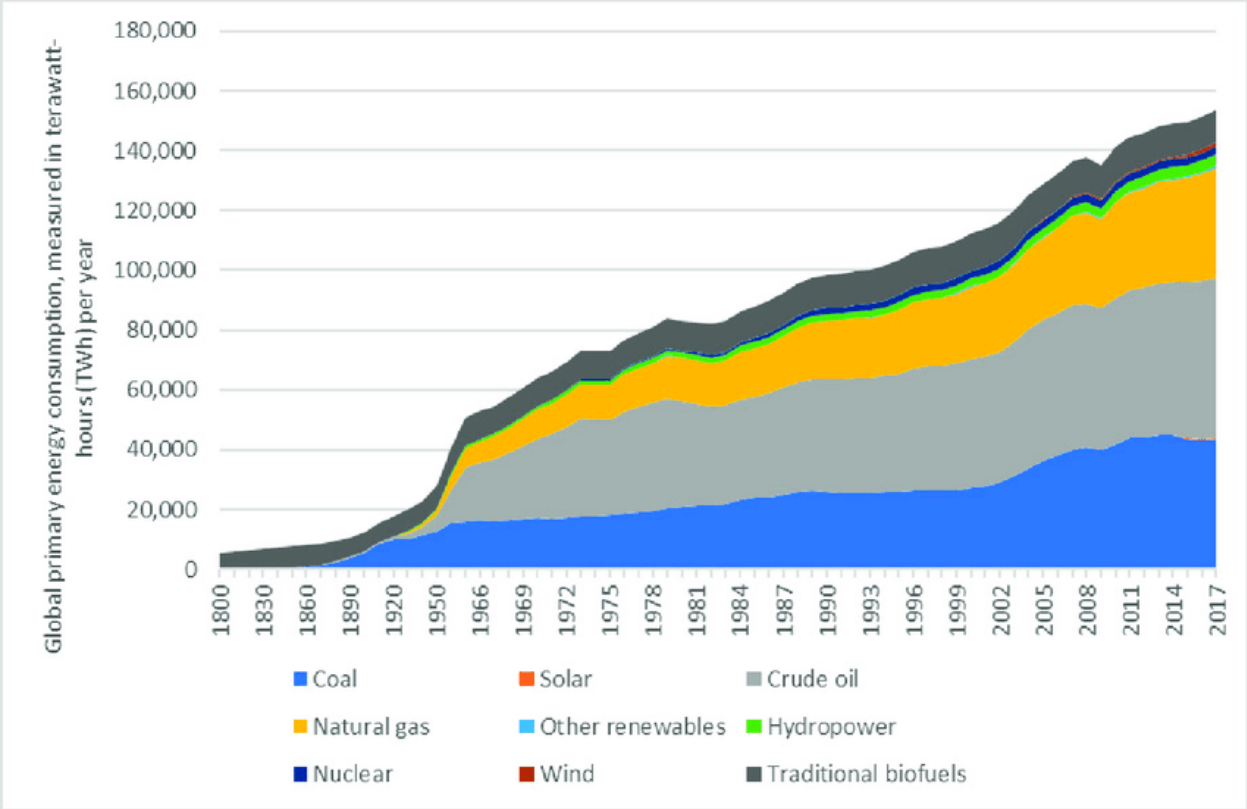
Compost your food waste if possible.

We need to talk about this. -25

Question 03

INTERNATIONAL ENERGY COMPARISONS

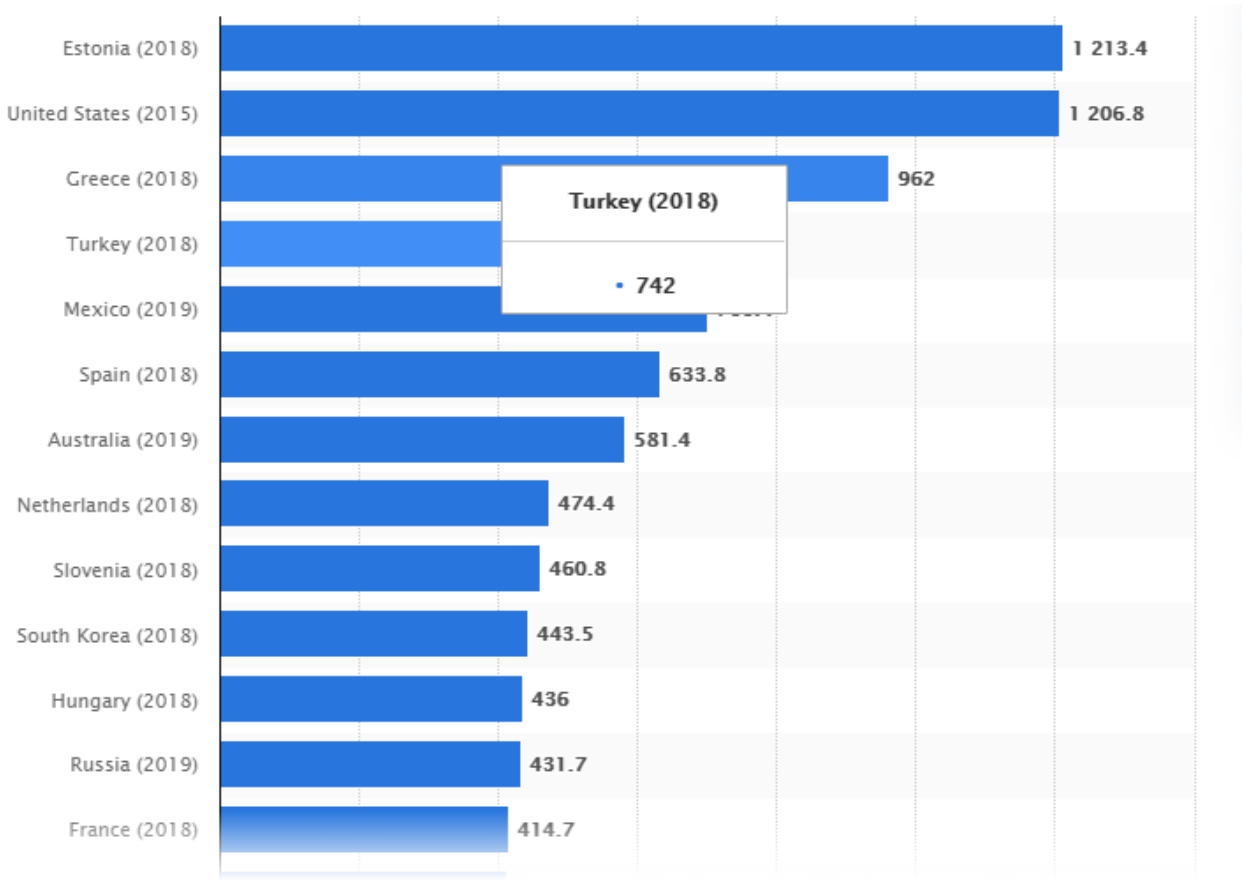
a) Global primary energy consumption in 2017



Graph 1: Energy Consumption Graph

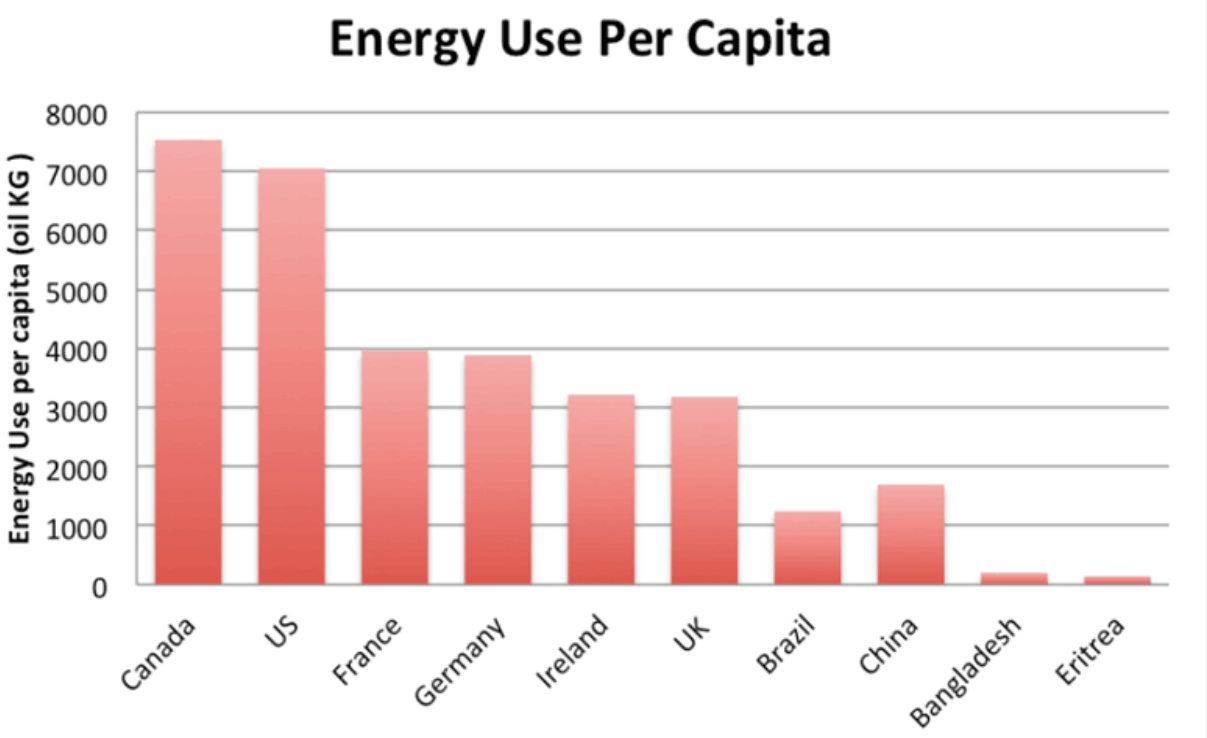
b) In 2018, U.S. total primary energy consumption was about 101 quadrillion British thermal units (Btu), which was about 17% of total world primary energy consumption of about 598 quadrillion Btu. The United States' percentage share of world population was about 4% in 2018.

Other countries in the world with different water consumption include following:



Graph 02: Other Countries in world with different Water Consumption

c) Ratio Between Countr

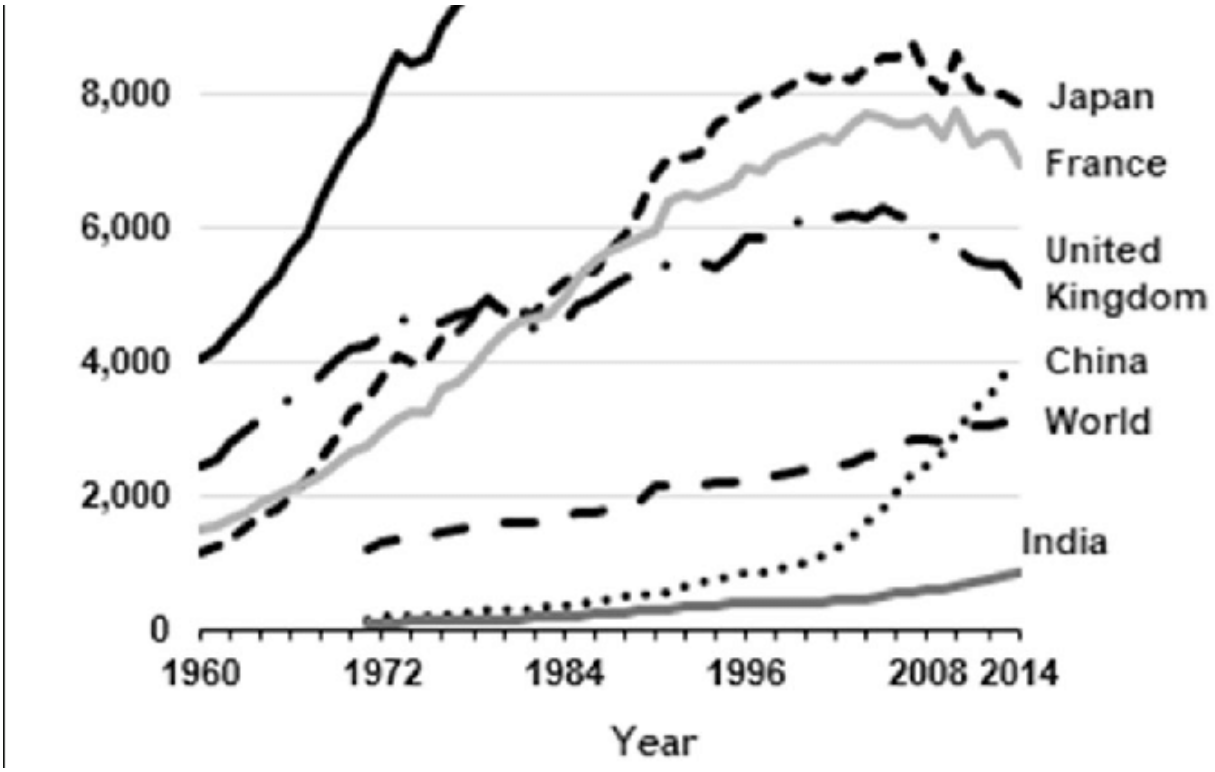


Graph 03: Ratio Between different Countries

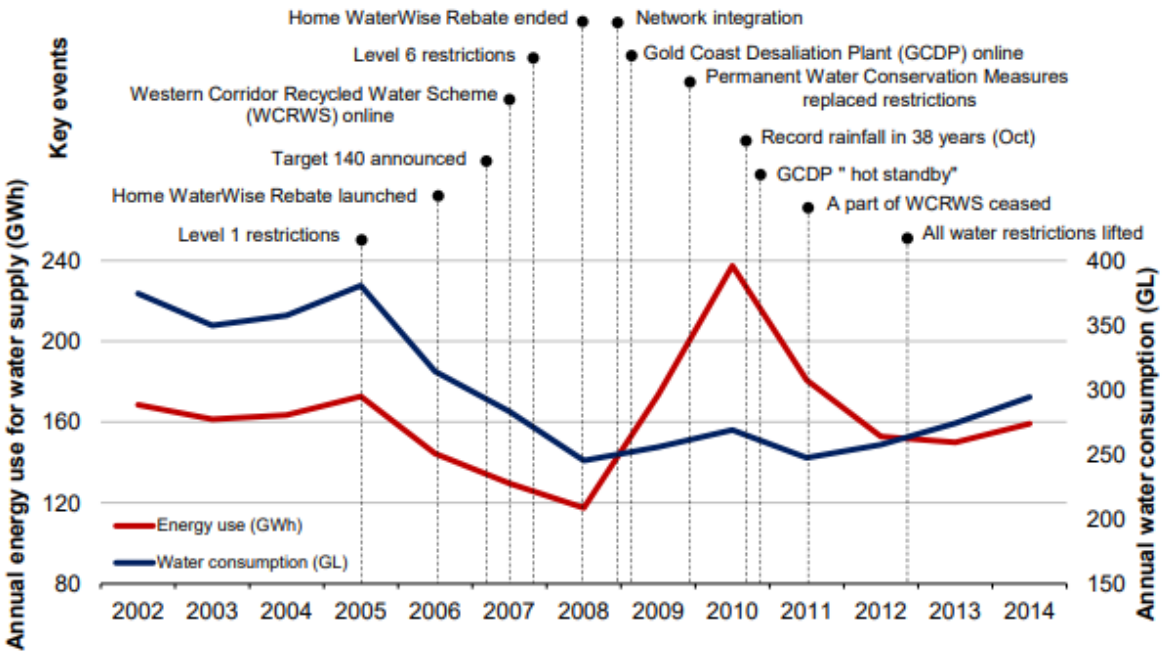
Countries include following:

- ✓ Canada
- ✓ US
- ✓ Germany
- ✓ France
- ✓ UK
- ✓ Ireland
- ✓ Brazil
- ✓ China

d)



The water energy trajectory diagram provides a new way to illustrate and compare longitudinal water consumption and associated energy use within and between cities. The very different "water-energy" trajectories in the two regions arose partly due to the type of water management options implemented, particularly the different emphasis on supply versus demand side management.



Graph 05 : Trajectory Water Consumption

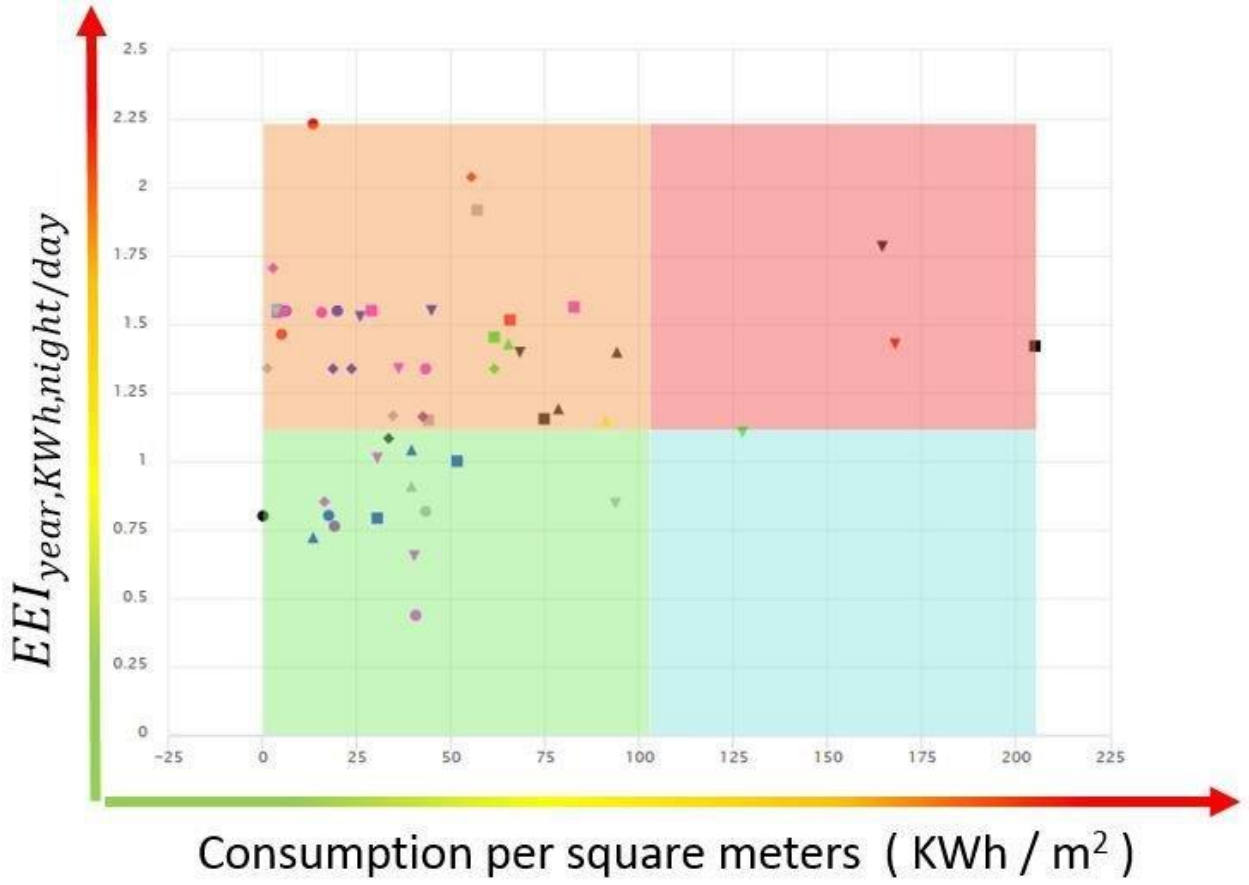
In 2002, Perth had a similar per capita water consumption rate to SEQ, and 48% higher per capita energy use in the water supply system than SEQ. By 2014, the per capita water consumption in SEQ became 28% lower than that of Perth, while the per capita energy use in Perth had increased to 470% of that of SEQ. The water consumption rate in SEQ reduced significantly from 2005, while there has been only a moderate reduction in Perth since 2008 (Figure 4). As stated above, the Millennium Drought in SEQ was most pronounced during 2005 to 2008. It led to the implementation of strict water restrictions and water conservation schemes (Table 1). This explains the distinct reduction in the per capita water use in Figure 4. The average residential water consumption in SEQ greatly reduced from 282 litres per person per day (L/p/d) in 2005 (Queensland Water Commission, 2010) to 143 L/p/d in 2012 (Queensland Water Commission, 2012), while the total urban water use dropped from 450 L/p/d in 2005 to 240 L/p/d in 2012.

e) Regarding the relationship between real GDP and energy consumption, these findings show that for all countries, **GDP has a positive effect on energy consumption**. In the cases of Colombia and Venezuela, a 1% increase in real GDP increases energy consumption by 0.82%.

#	Country	GDP (PPP) per capita (2017)	GDP (nominal) per capita (2017)	vs. World PPP GDP per capita ($17,100)
1	Qatar	$128,647	$61,264	752%
2	Macao	$115,367	$80,890	675%
3	Luxembourg	$107,641	$105,280	629%
4	Singapore	$94,105	$56,746	550%
5	Brunei	$79,003	$28,572	462%
6	Ireland	$76,745	$69,727	449%
7	United Arab Emirates	$74,035	$40,325	433%

Table 01

Correlation between energy water consumption



X-axis represents consumption per square meter while y-axis corresponds to the night/day energy efficiency index.