Simple Measurement
The watts fluctuate when first power on, but it reach a steady state at around 4.7w

Network Activity
Use Wireshark to capture the network activity on external ethernet on the lab machine. Record the number of events in a minute: 127events/sec

When the pi is sending the power increases from 4.6w to 5.1w; when the pi is receiving the power increases from 4.6w to 4.9w. Sending is consuming more power. When sending, the pi is generating message and sending actively, while receiving, it is listening passively, the generation and sending process may consume power and could be the reason for the difference.

When doing iperf, the power of pi change to around 5.6w, some instances up to 7w

Original rx-usecs value is 57

After changing rx-usecs value to 0, the power consumption doesn't change much.

During the stress CPU test the power consumption goes up to around 6.3w. This is higher than power of network activity.

During high network activity the CPU is also executing instruction, the power consumption of network activity is also contributed by CPU.

Theoretical Experiment
France:
CI = 20g/kWh

pi energy consumption: 14Wh

CF = 0.014*0.02 = 0.00028kg

From now to 2030, a single raspberry pi will consume 5*365*24h x 5w = 219kWh
30B raspberry together will consume $6.57*10^{12}$kWh

With additional 30B, it will be $9.85*10^{12}$kWh

Total CF will be $1.97*10^{11}$kg

This estimation is not accurate, there are devices that consume much more power on the network