



arm

Arm Power Kernel Team

Improving responsiveness of interactive CFS tasks using util_est

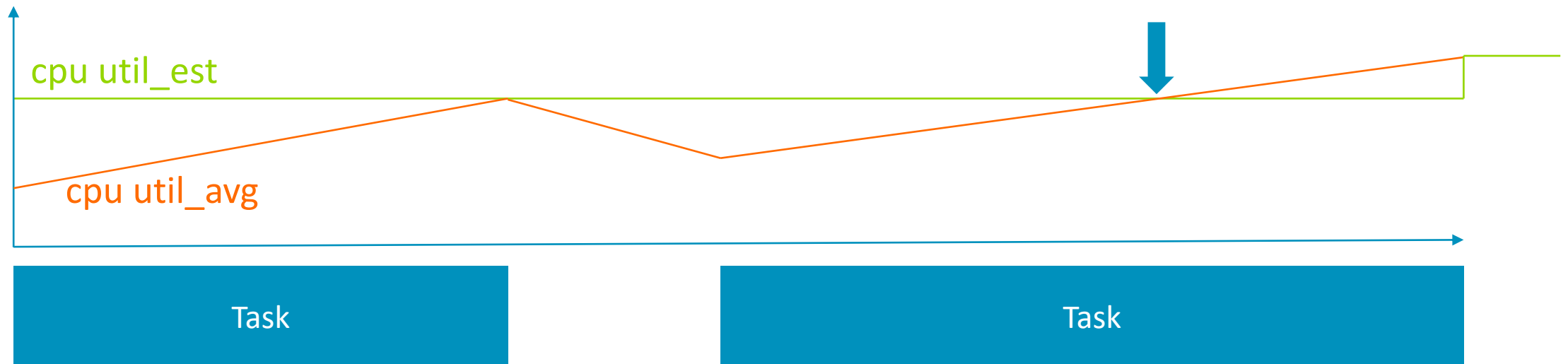
LPC 2021 Sched MC

Vincent Donnefort
20th Sept 2021

Previously ...

[RFC,v4,0/6] sched/cpufreq: Make schedutil energy aware (by Douglas Raillard – Jan 2020)

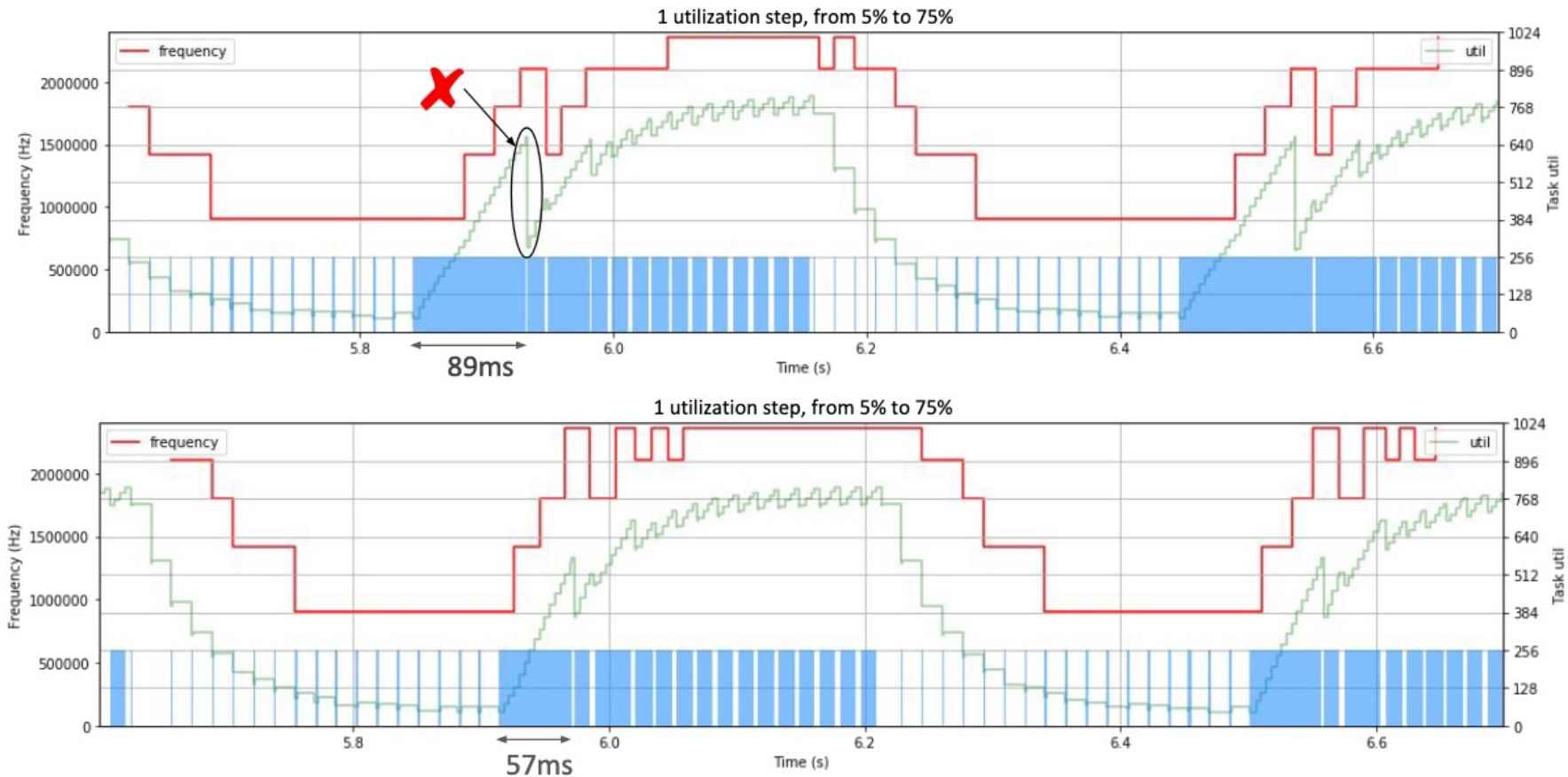
util_est based boost trigger:



Previously ...

[RFC,v4,0/6] sched/cpufreq: Make schedutil energy aware (by Douglas Raillard)

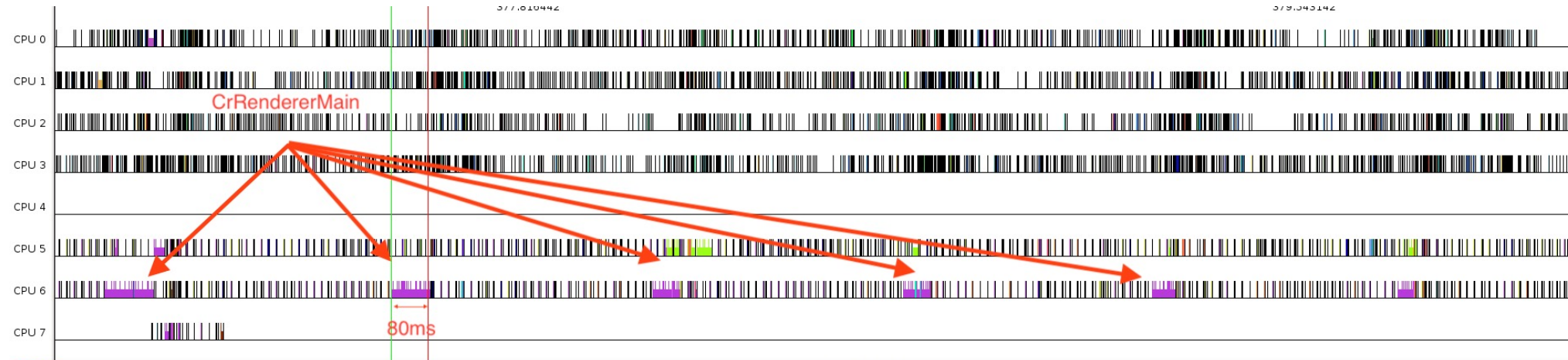
Improve
frequency
selection



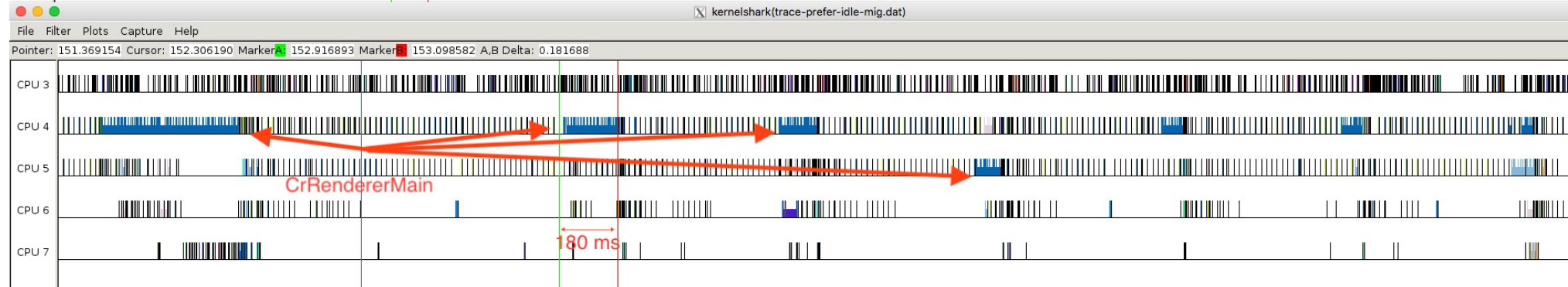
Interactive workload

PCMark Web2:

WALT

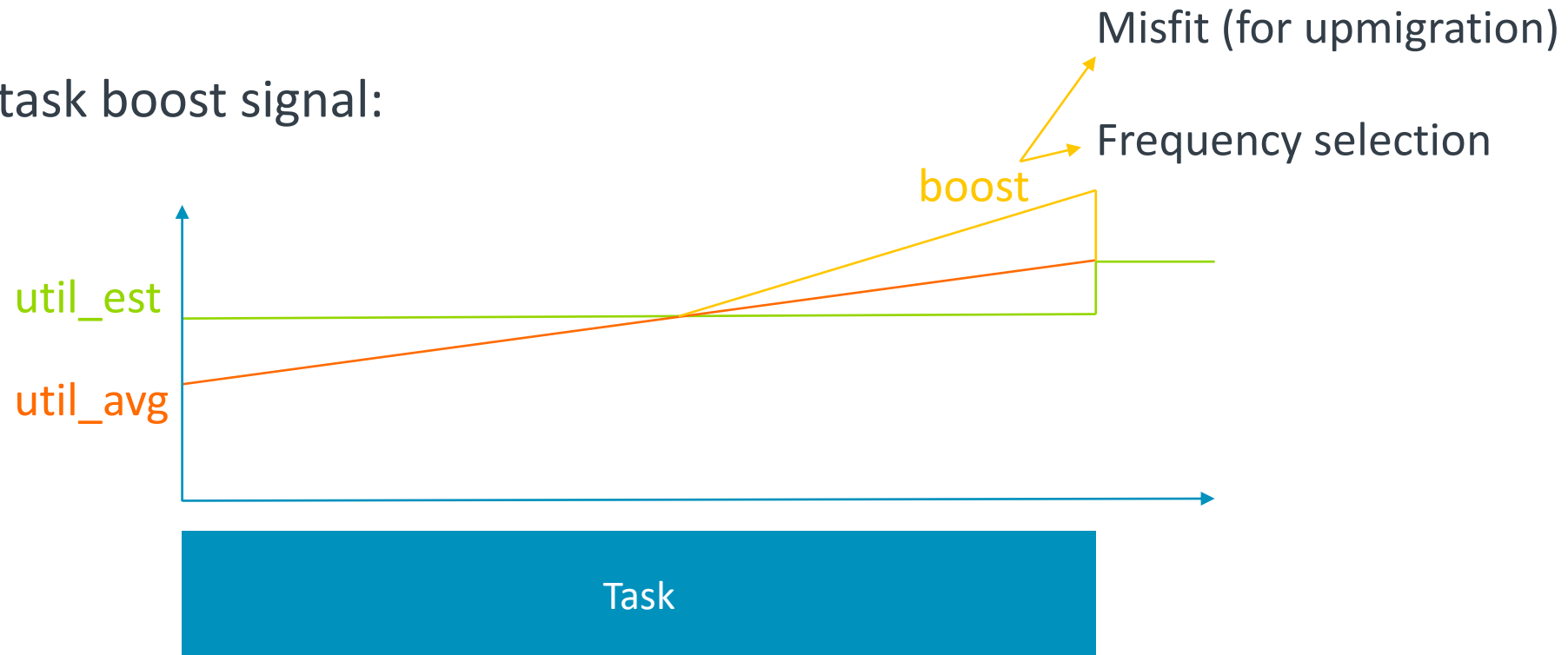


PELT



Updated proposal

New per-task boost signal:

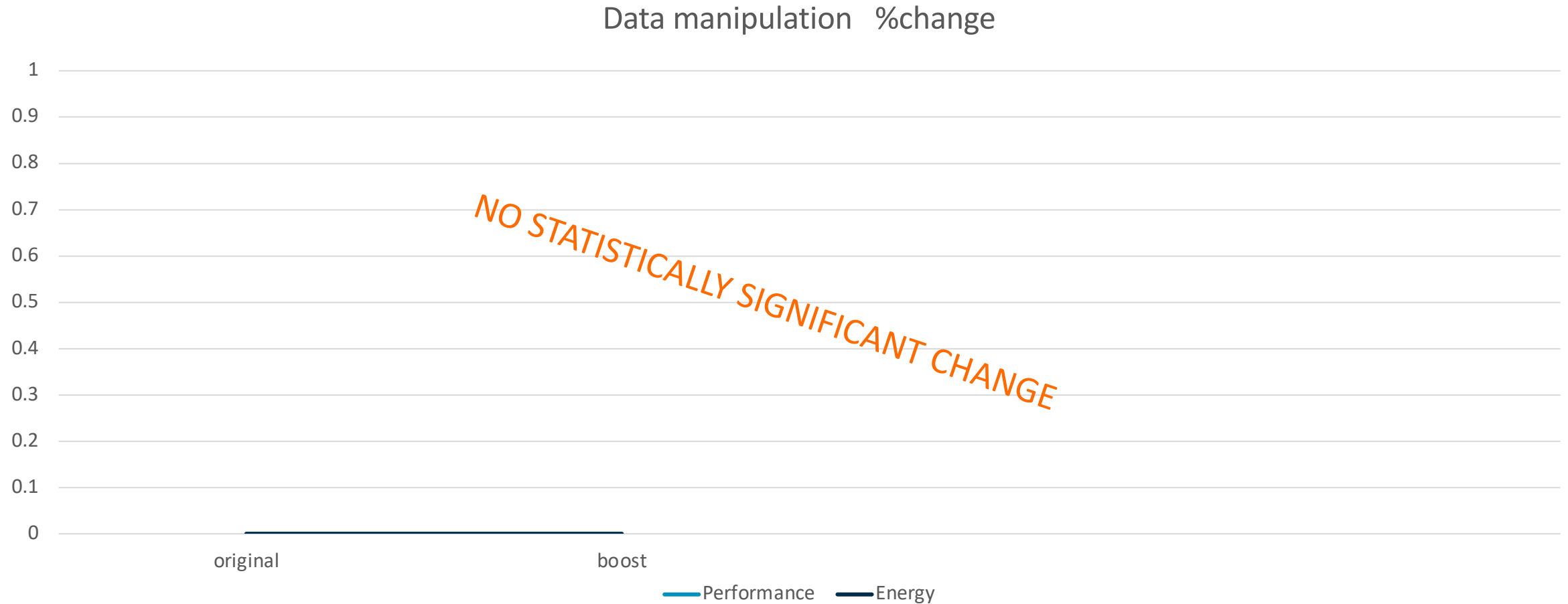


$$\text{boost} = (\text{util_avg} - \text{util_est}) * \text{FACTOR} + \text{util_avg}$$

Evaluate the proposal

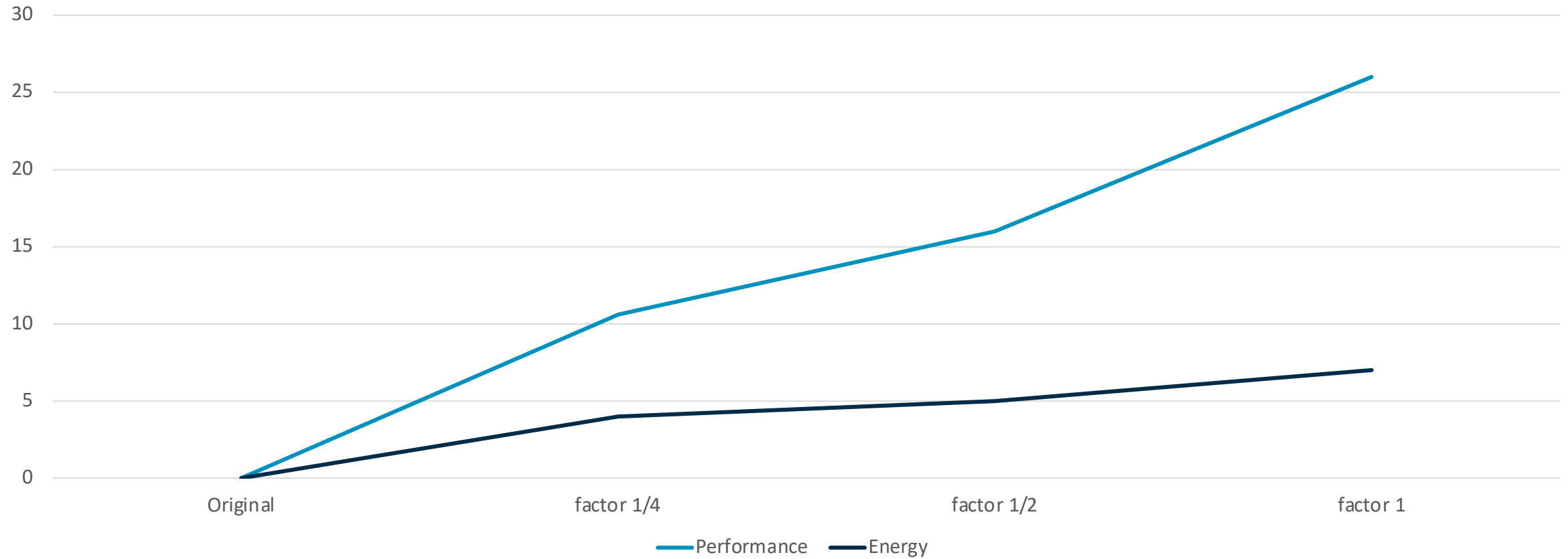
- Pixel4
- Mainline'ish kernel/sched
 - No vendor value-add
 - No schedtune boosting
- 30 runs Android PCMark2
- Energy estimation based on idle states / frequency selection

PCMark: Data manipulation



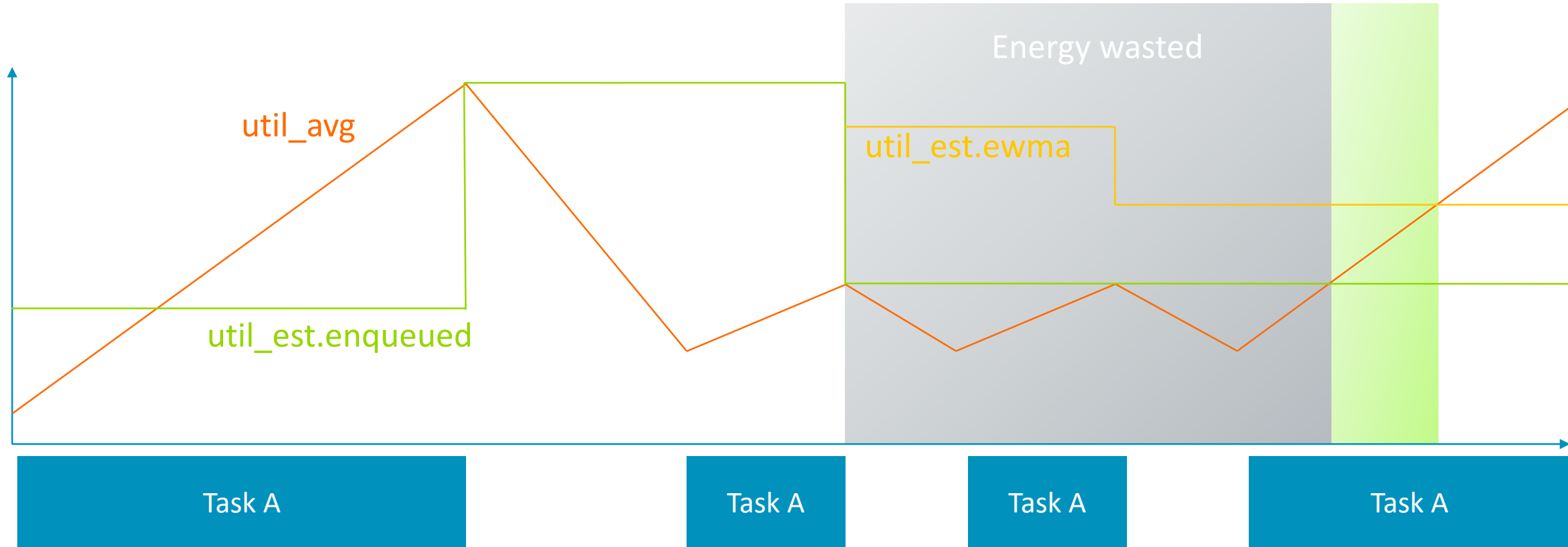
PCMark: Web2

Web2 %change

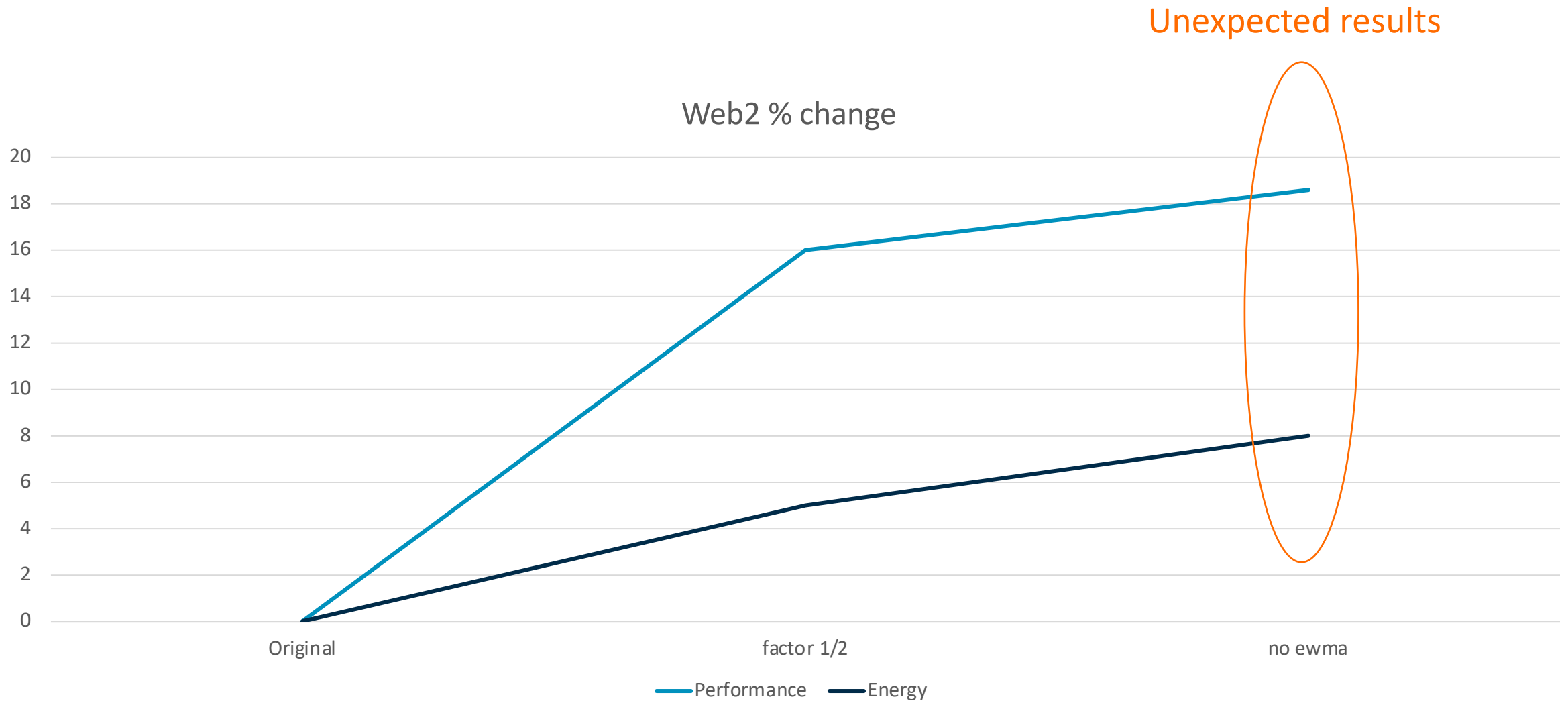


Removing util_est.ewma?

$$\text{util_est} = \max(\text{enqueued}, \text{ewma})$$



Removing util_est.ewma?



Discussion ...