

WIGNER Datacenter Site report

HEPIX Spring 2015, LBNL

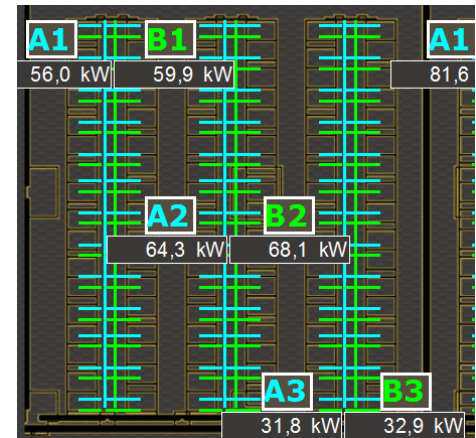
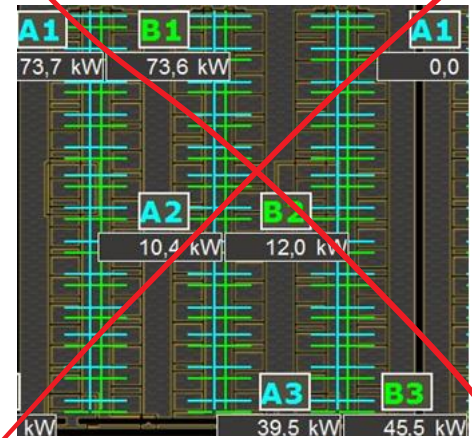
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WDC Infrastructure

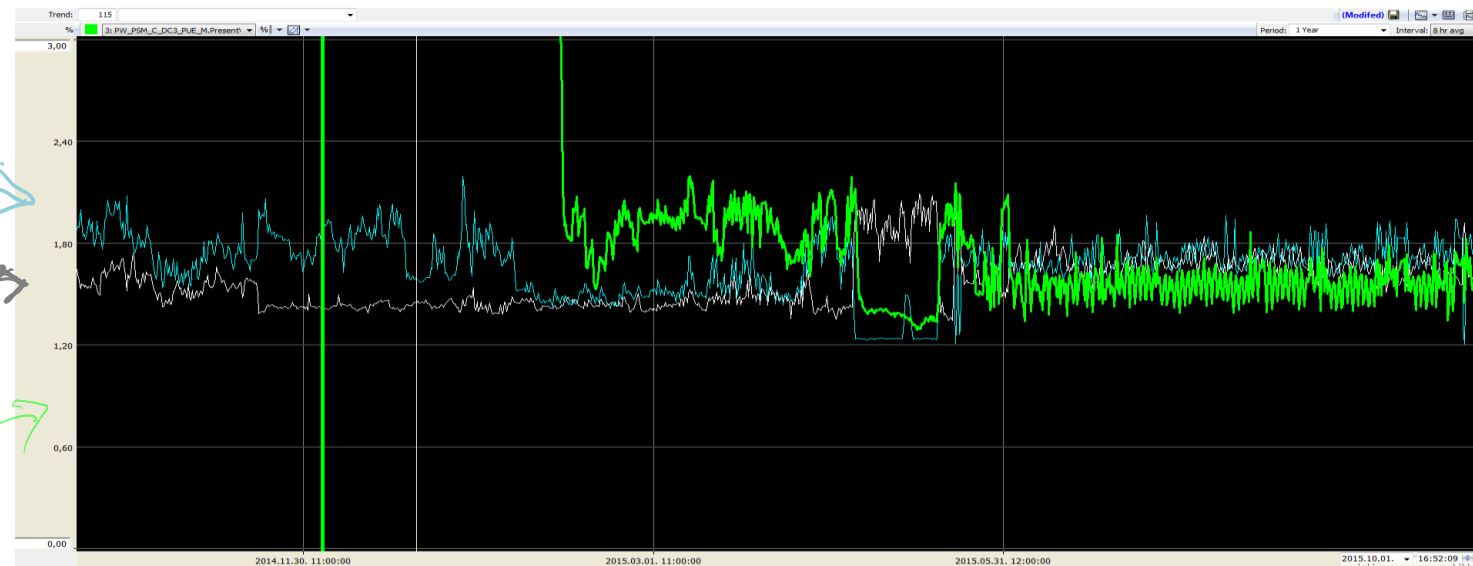
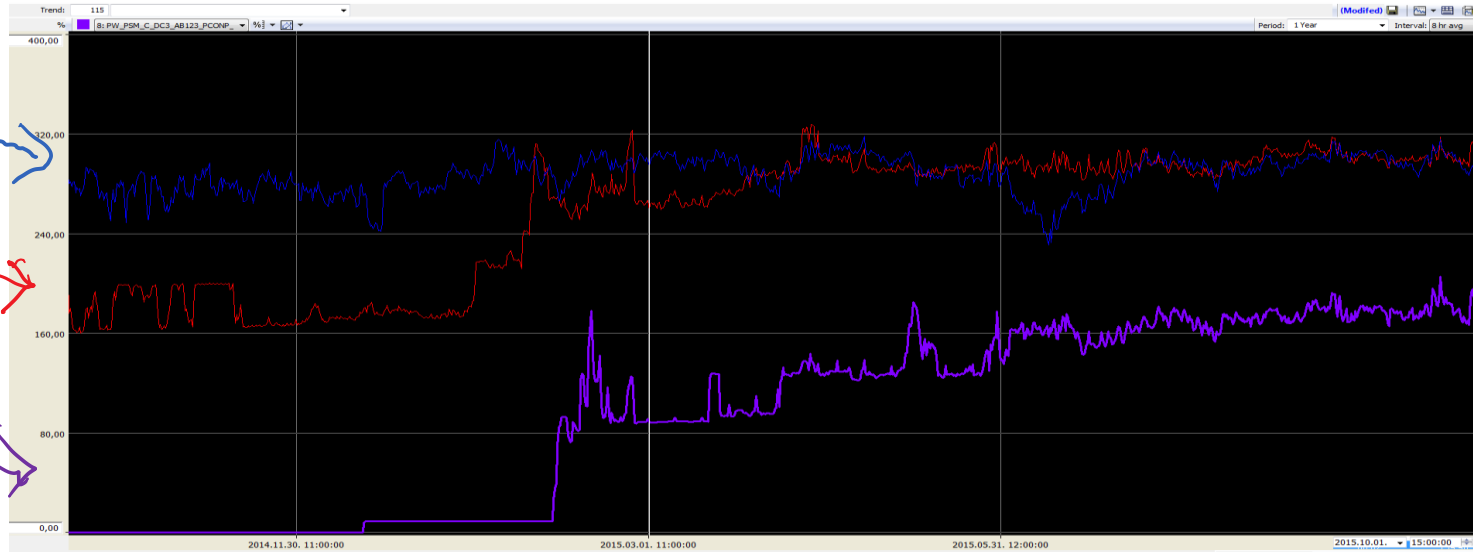
- 4x 300 m² whitespace, **1MW blocks**
- 2x 10 kV power input, 120/10 independent
- (4+1)x 2 MW transformers
- 4x 2 MW diesel generators w/ 8 hrs. fuel tank
- 4x 2 MW (A+B) UPS for IT (10 min.)
- UPS for critical infrastructure systems
- 14x 440 kW IT chillers: 2x (N+1), **12/18°C freecooling**
- Integrated facility management: **Honeywell EBI**
- 24/7 infrastructure op. (9 FTE)
- 9x5 hosting operation (2.5 FTE)

WDC Power & PUE

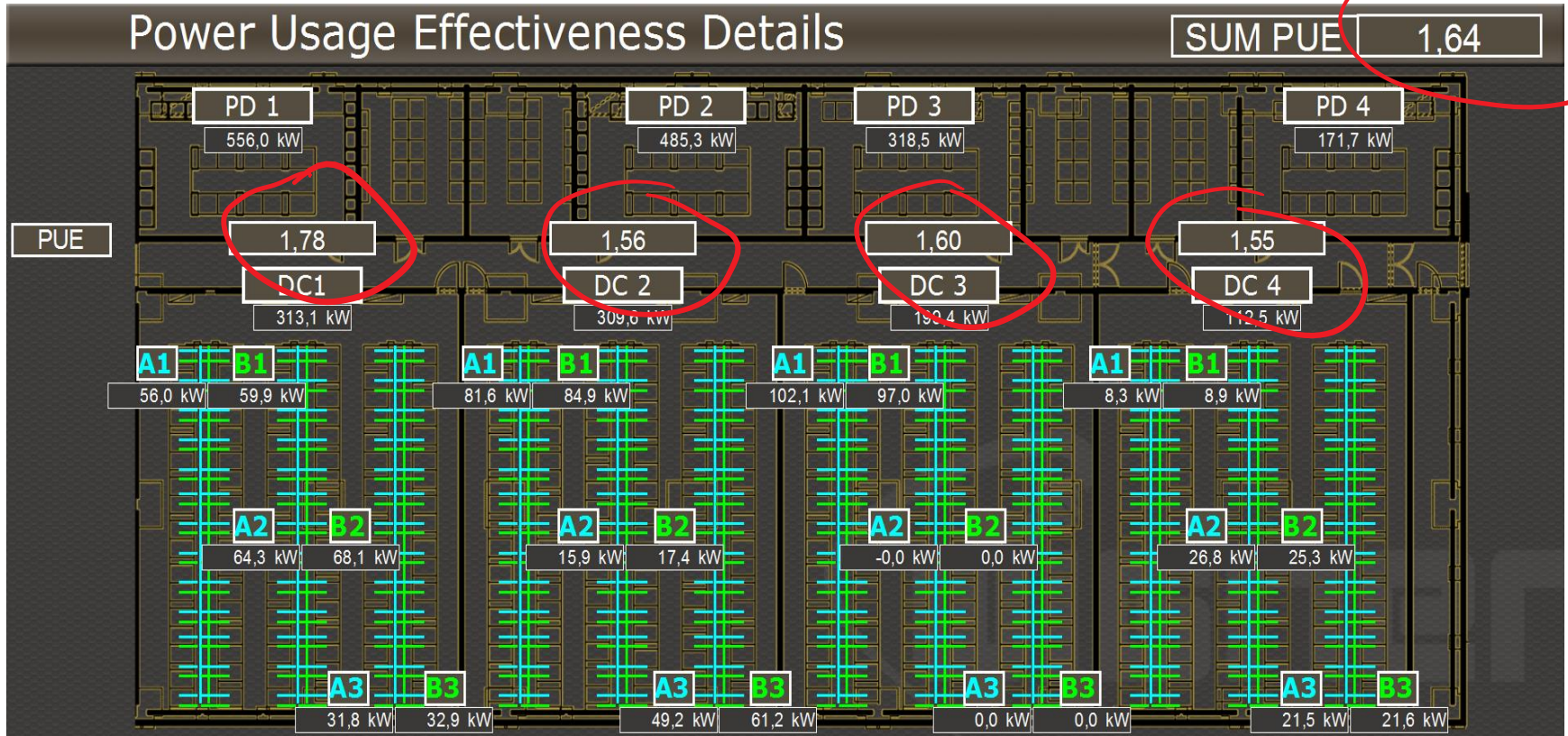
- Balance A/B power ✓
- Balance 3 phases ✓
- Understand the cause for underutilization !
- Understand freecooling ?
- Improve monitoring !



WDC Power & PUE



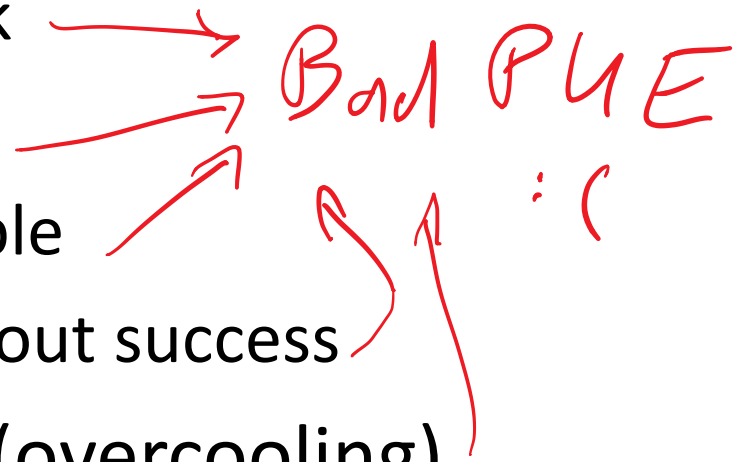
WDC Power & PUE



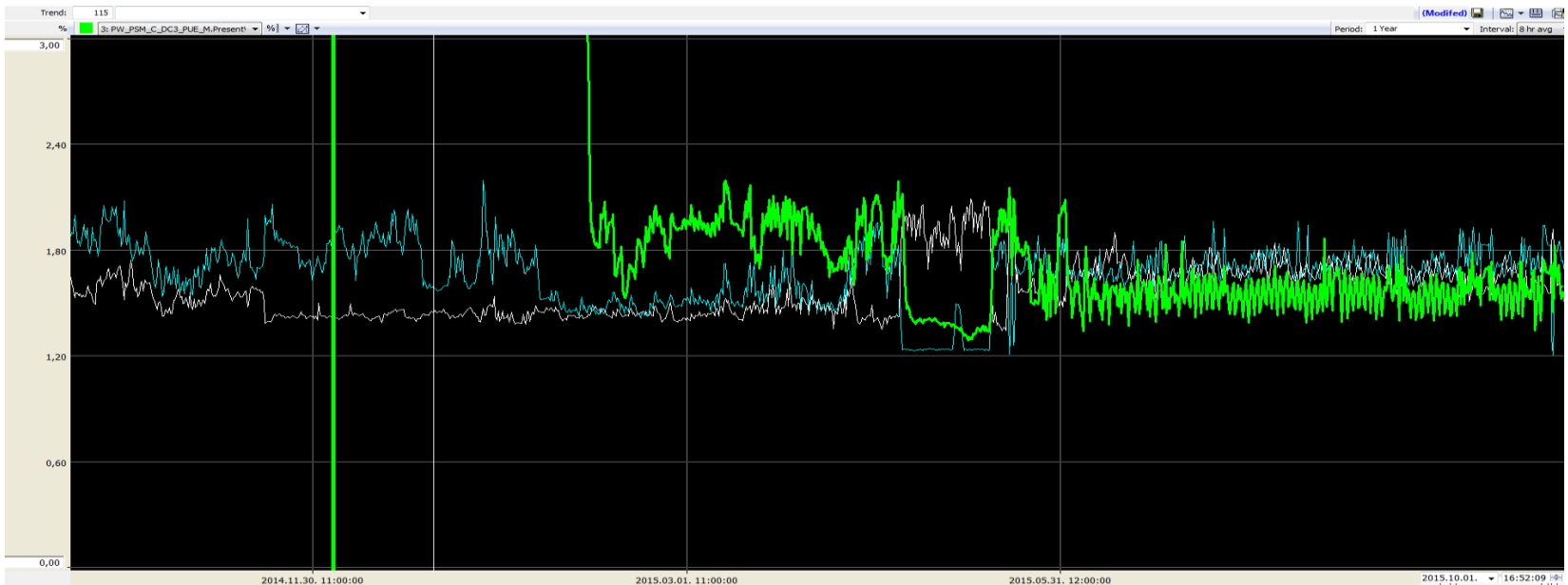
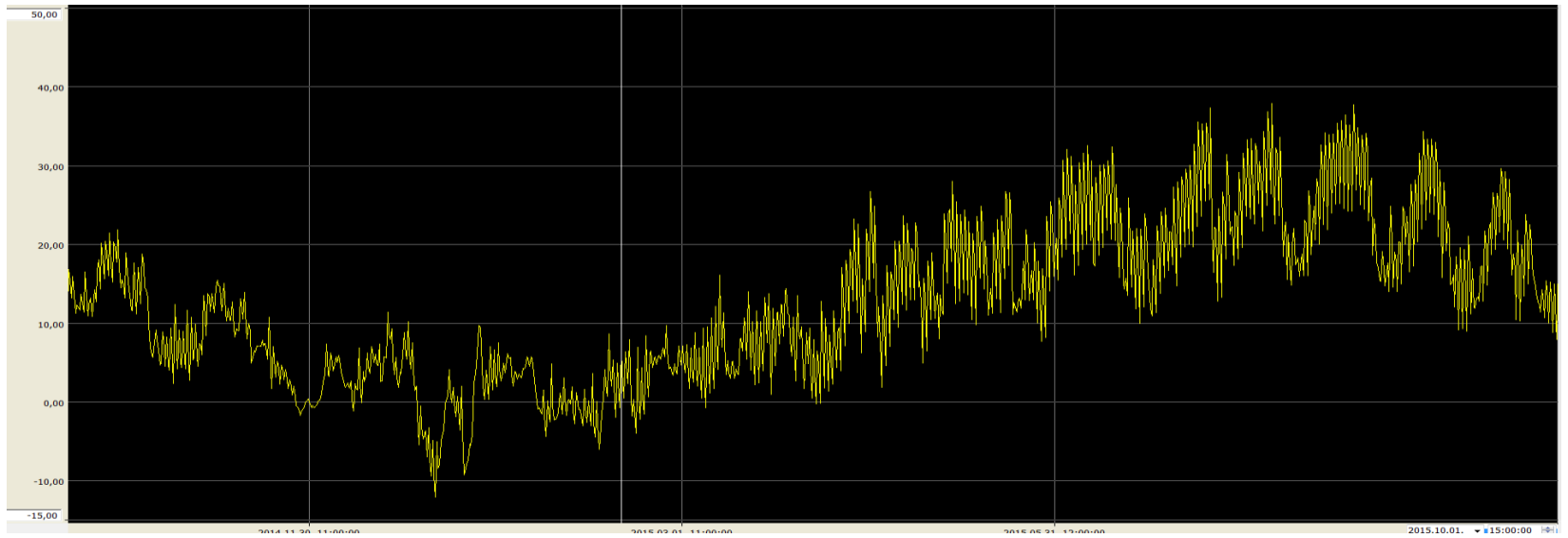
WDC Cooling

- Pressurizer now stable (fixed 2014 summer)
- Single-chiller control well understood
- Chiller cluster regulation: complete mess!
 - Freecooling does not work
 - Time-shifting not reliable
 - State transitions not reliable
 - Several FW upgrades without success
- IT load way under target (overcooling)

Bad PUE : (



WDC Cooling



WDC Infrastructure events

3 major incidents in the last 18 months:

- 2014.07.22 overheating during LCP maintenance: human error due to incomplete documentation and additional monitoring problems (60 minutes, SLA impact within the tolerance range)
- 2015.04.15 overheating after pump maintenance: human error due to incomplete documentation and additional pump control logic problems (12 minutes, SLA violation and penalty)
- 2015.09.28 UPS failure due to exploding IGBT: still under investigation. Monitoring problems involved. No SLA impact.

WDC Infrastructure events



WDC Monitoring

- Honeywell EBI: insufficient & unreliable
 - Still too many false alarms
 - No alarms when needed
 - Proprietary: expensive, 'black box'
 - Involved in all major incidents
- New independent system under construction
 - Independent SNMP-based sensor network
 - FOSS-based data acquisition and metric history
 - Will operate alongside EBI
 - Will provide data for new freecooling control logic

Tier-0 hosting

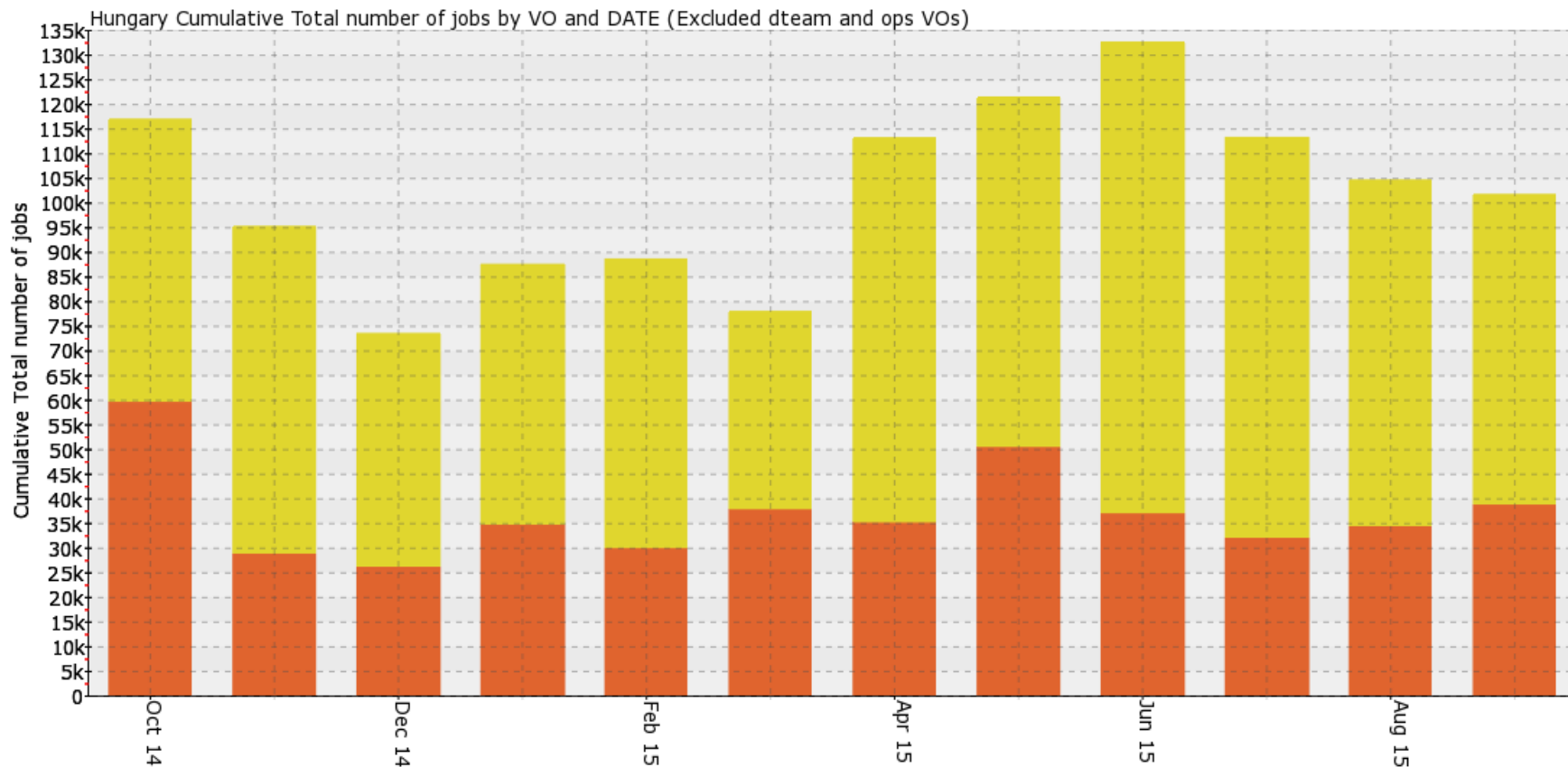
- 188 racks (most installed in 2014)
- Consistent metrics / accounting since 2014
- ~ 6.3 GWh IT consumption in 2015 (est.)
- Support tickets:
 - 239 request tickets (11 delayed, 4 missed)
 - 436 incident tickets (13 delayed, 3 missed)
- Parts exchanged:
 - 249 harddisks
 - 110 memory bars
 - 20 PSUs
 - 18 mainboards
 - 13 CPUs
 - 6 backplanes...

Tier-2 site report

CMS & ALICE jobs

Developed by CESGA EGI View: / njobs / 2014:10-2015:9 / VO-DATE / custom (x) / ACCBAR-LIN / x

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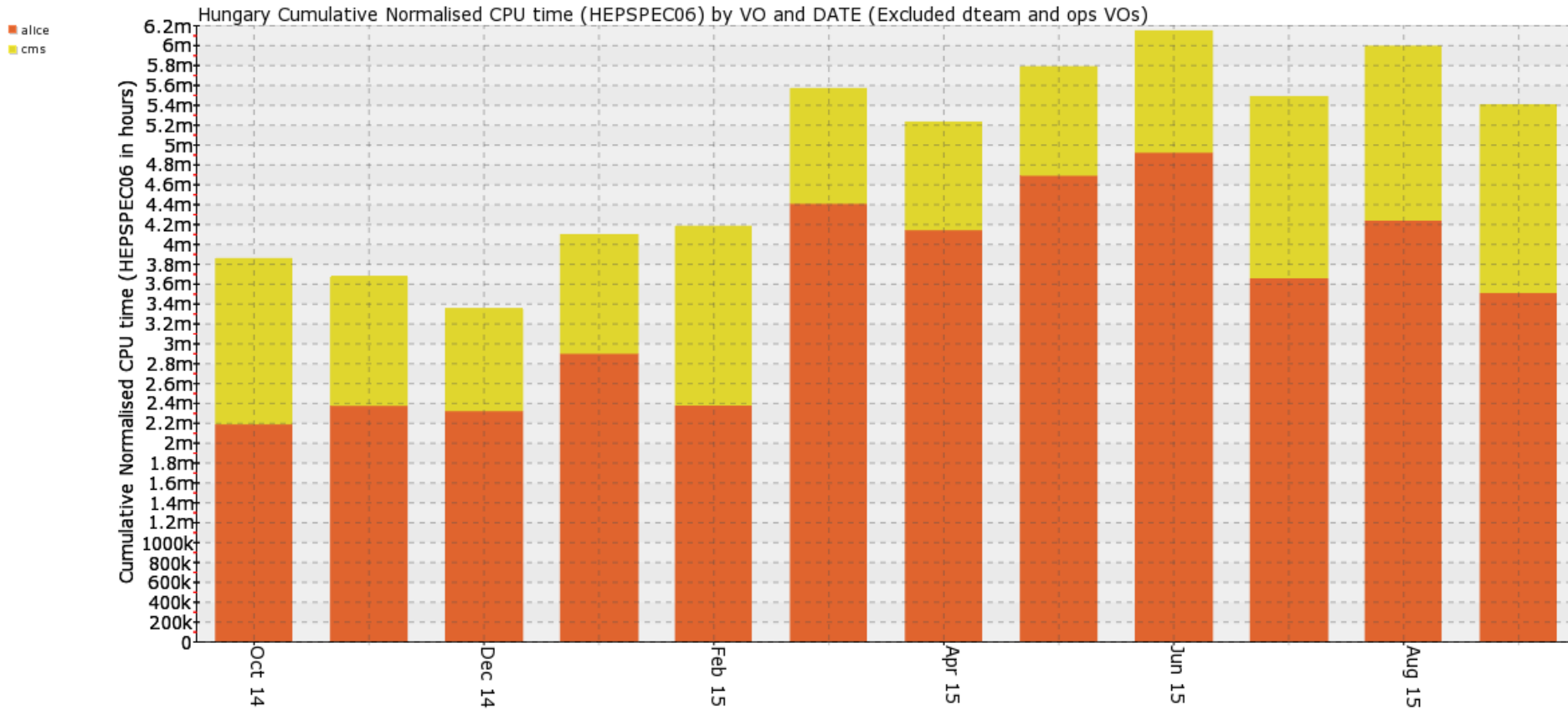


Tier-2 site report

CMS & ALICE normalized CPUtime

Developed by CESGA EGI View: / normcpu-HEPSPEC06 / 2014:10-2015:9 / VO-DATE / custom (x) / ACCBAR-LIN / x

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Thank you!