MTSS

MEDIA TECH SUSTAINABILITY SERIES

April 13, 2024 | Sustainability in Media 101 Training

Advancements in Sustainable Media Tech

Ben Schwarz

Greening of Streaming

James Stellpflug

EVS

We help our customers deliver the most gripping live sports images, buzzing entertainment shows and breaking news content to billions of viewers every day and in real-time.

Live Production, Replays and Highlights

Content Workflows and Media Assets

Media Infrastructure SDI and IP

Content Access and Content Distribution

Sustainable Value Creation

Ambitions 2030

Reduce

50%

our products carbon footprint

(per € sold)

top

50%

of Belgium Top Employers

above

30

Team member Net Promoter Score

above

30

Customer NPS **Devoncroft**

100%

of our direct suppliers in EcoVadis

Cyber Security

Maturity level 2 Cyber Fundamentals Framework

100%

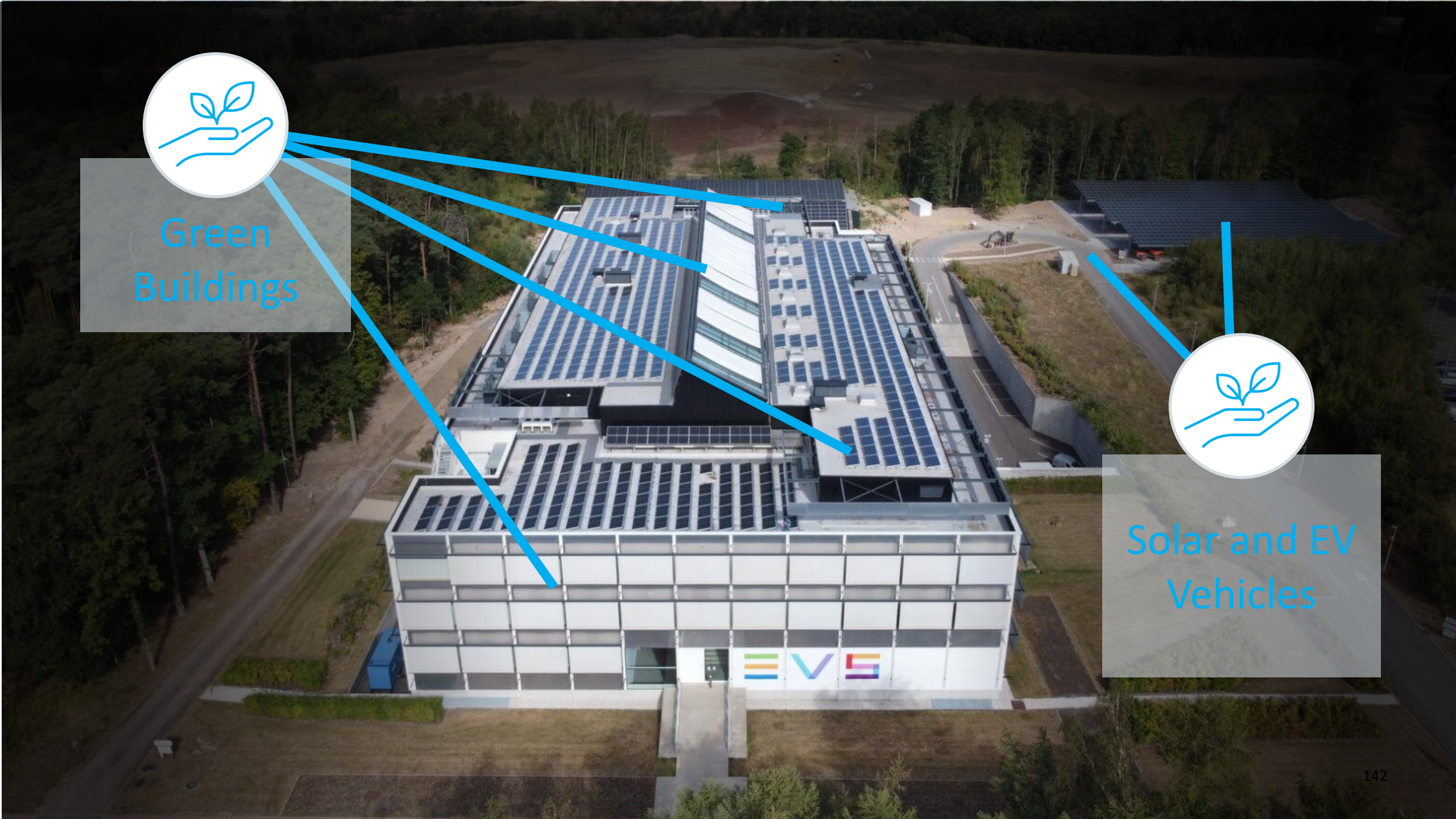
of our Team Members trained on ESG

100%

of our Team Members trained on ESG

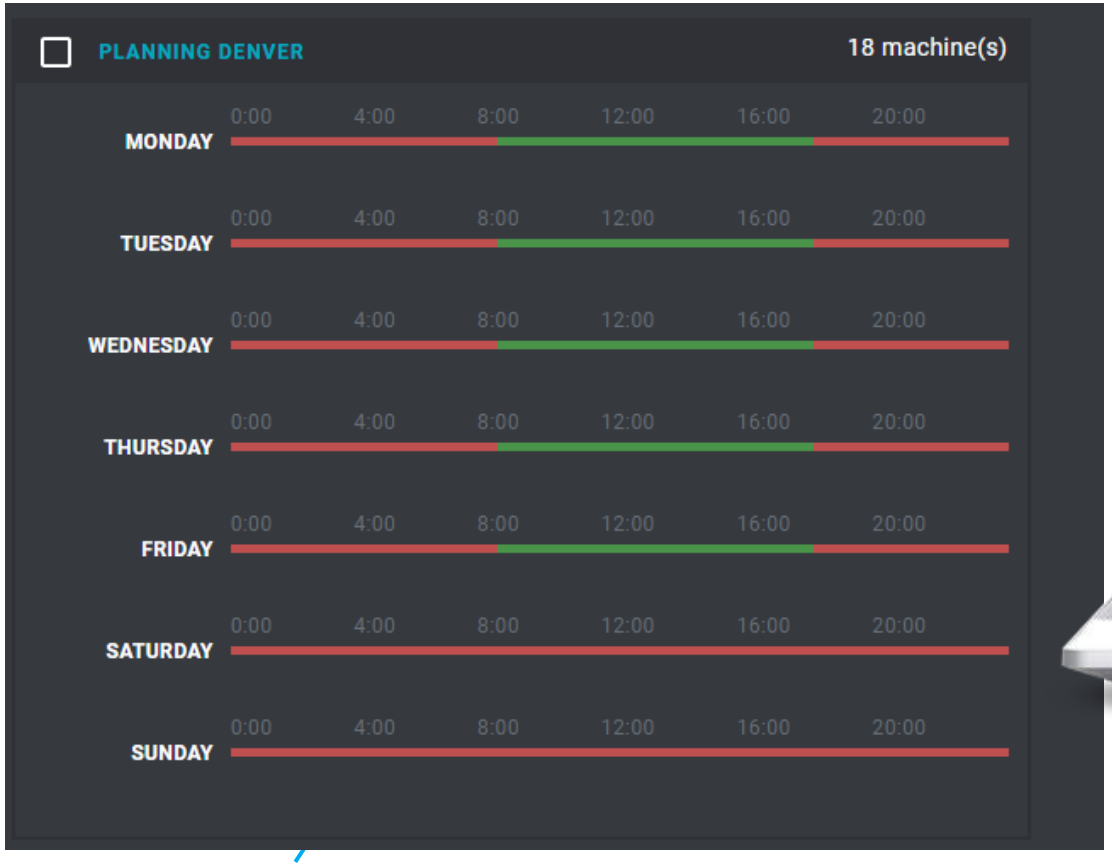
100%

of our direct suppliers in EcoVadis


Green Buildings
Solar and EV Vehicles

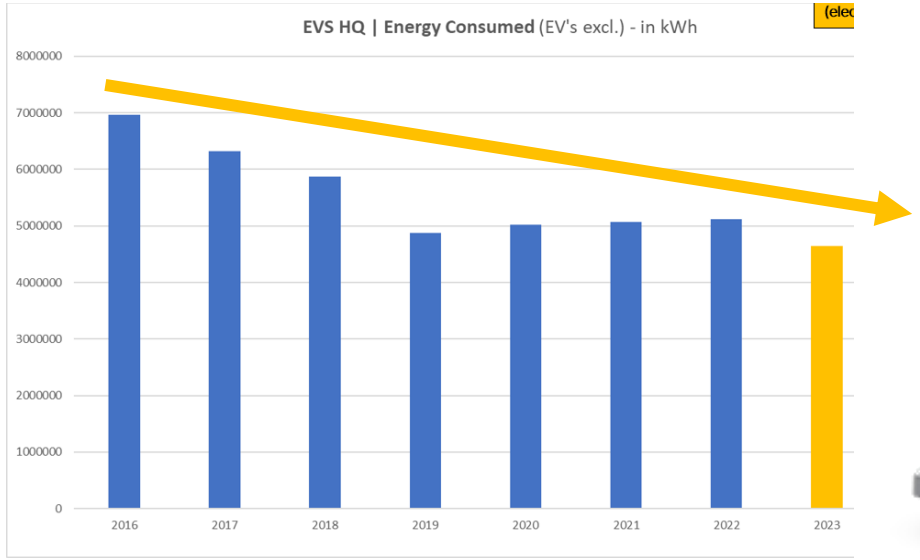
Monitoring to bring awareness

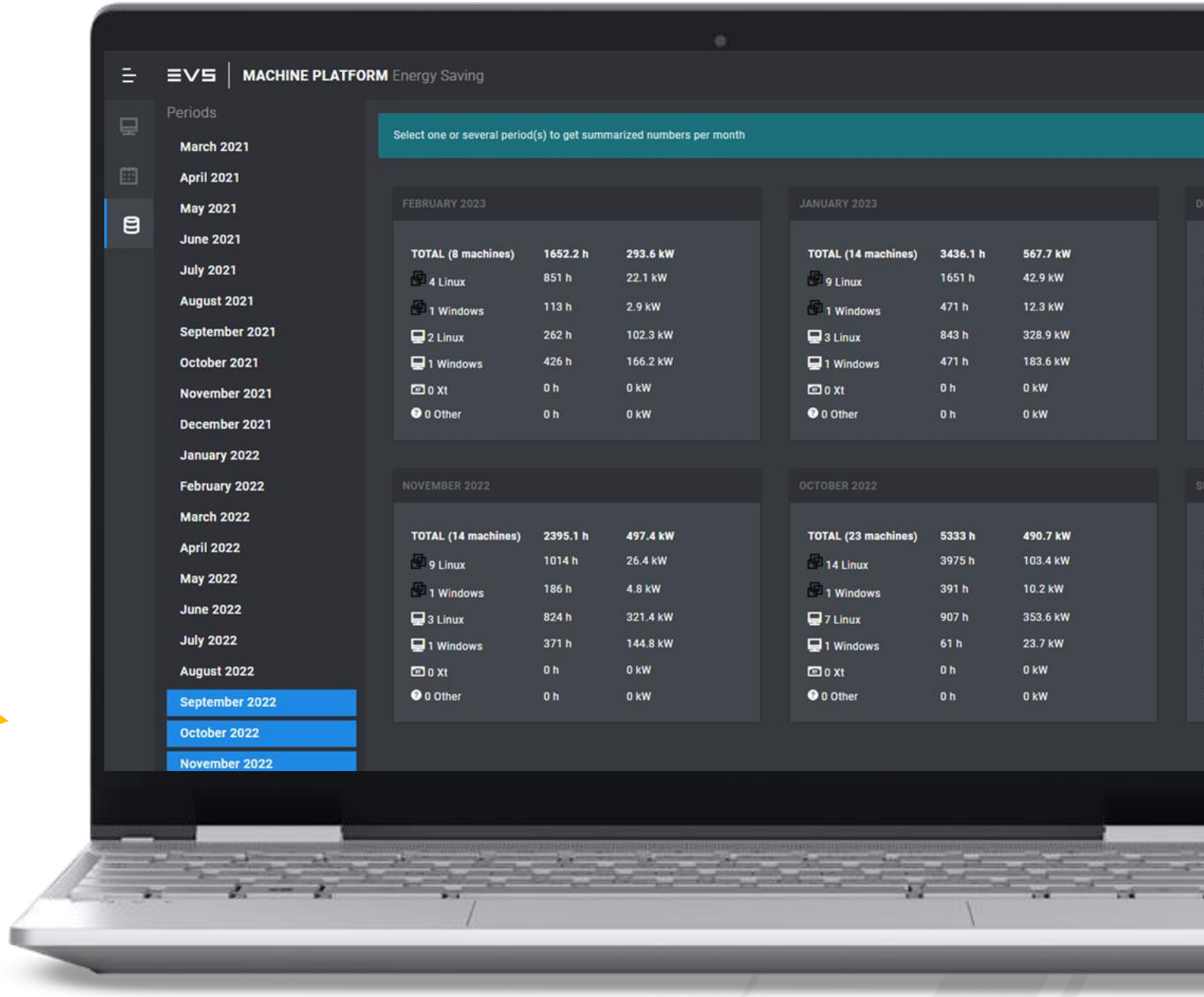
- Schedule optimizations



EVS internal tools

- Monitor and control our consumption
  - Monitoring toolset created
  - -9% reduction using internal tools
  - 4.6 GWh/year



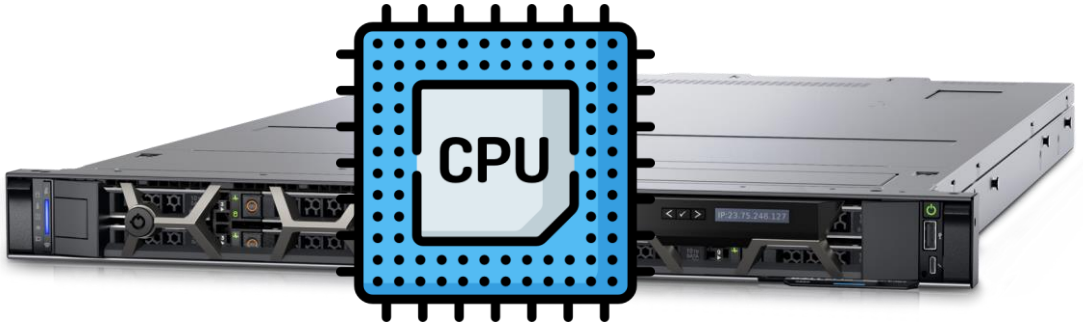


Reduce

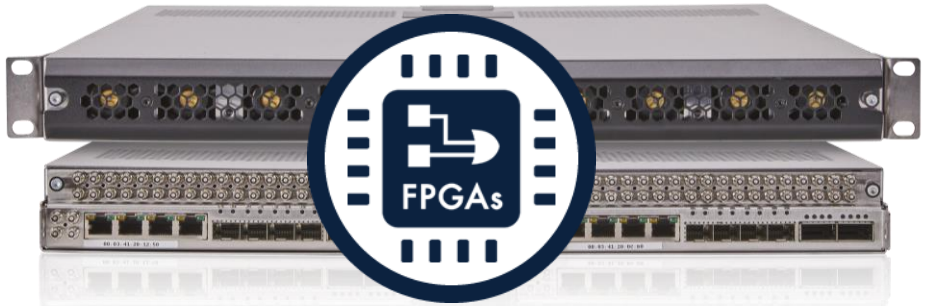
50%

our products carbon footprint

(per € sold)

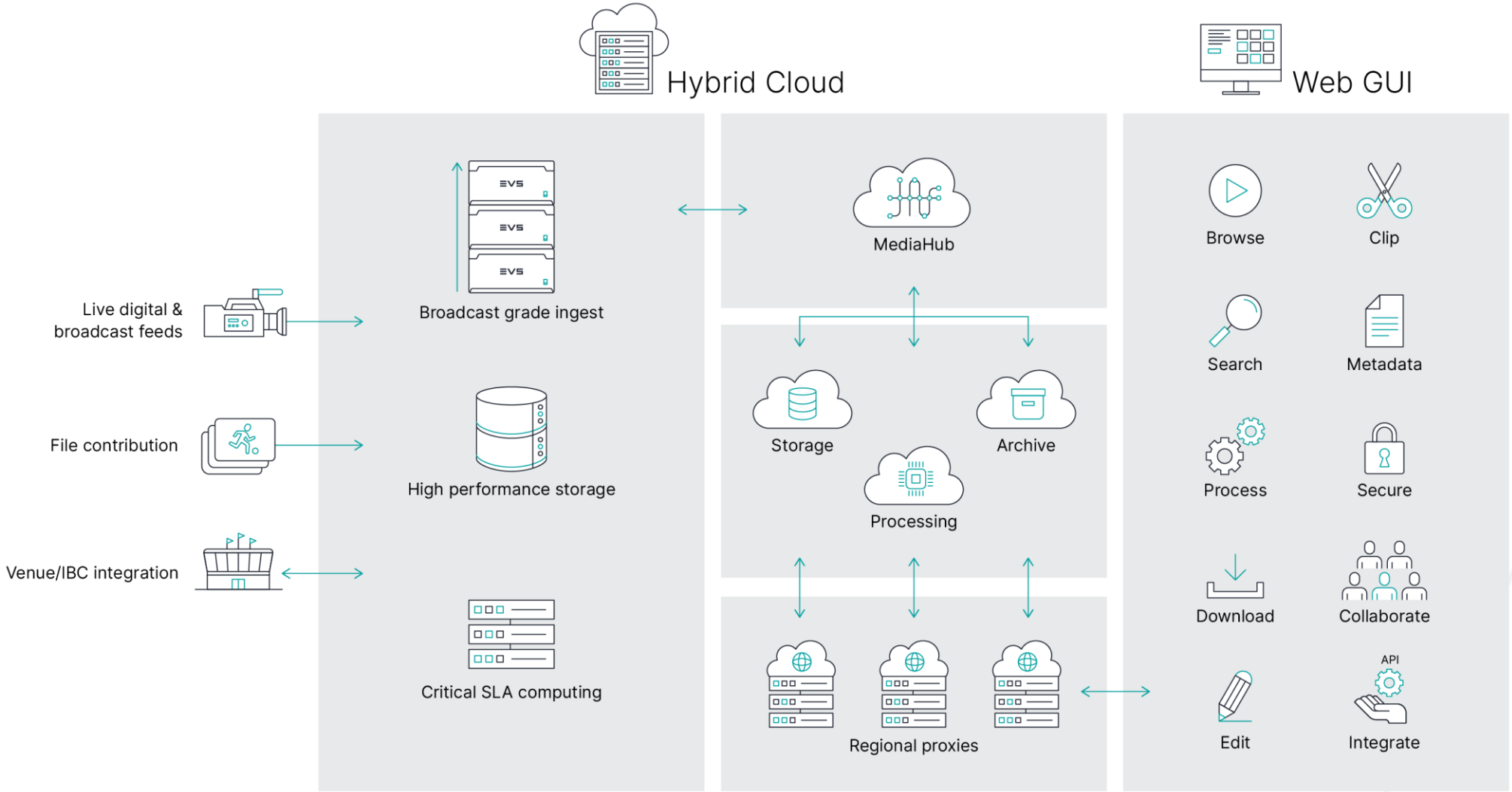


Power consumption: ~900W

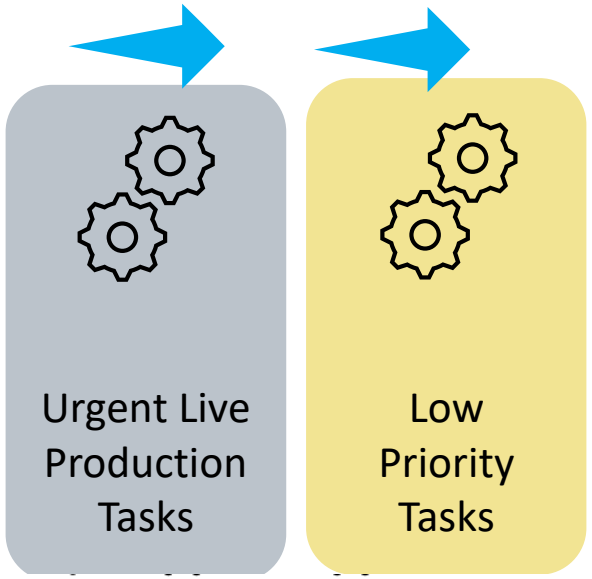


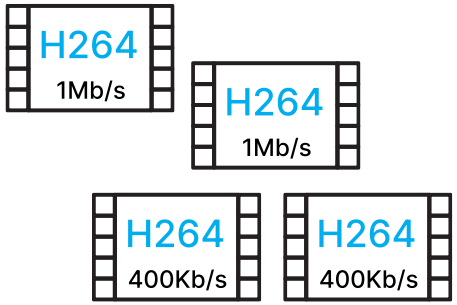
Power consumption **125W**

Balanced Computing



Shift workloads to low carbon energy periods





Timeshifting tasks to optimal energy periods

Save Money and be more green


EVS
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Sustainability
report
→ evs.com

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Greening of Streaming

Who we are

What we've been up to with REM

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Background

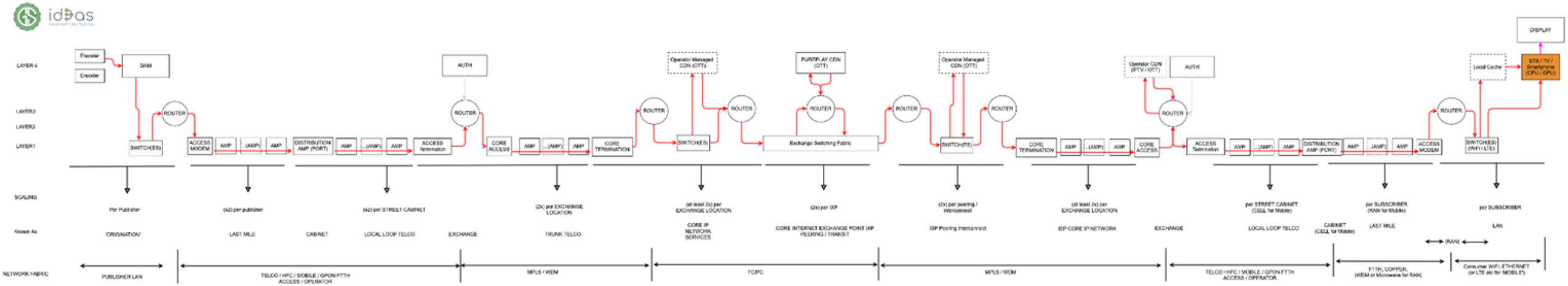
CDN / Streaming / Digital Media technology conferences have increasingly been focussing on sustainability.

When we started in 2021, there wa no ‘hub’ for engineering discussior focussed on sustainability.

That year, conversations at conferences grew into a one day event where we invited membership to form the organisation.

Non-profit, not an SDO, no lobbying, member-driven, focusing on engineering research and best practices.

Scope - From Origination to Consumption

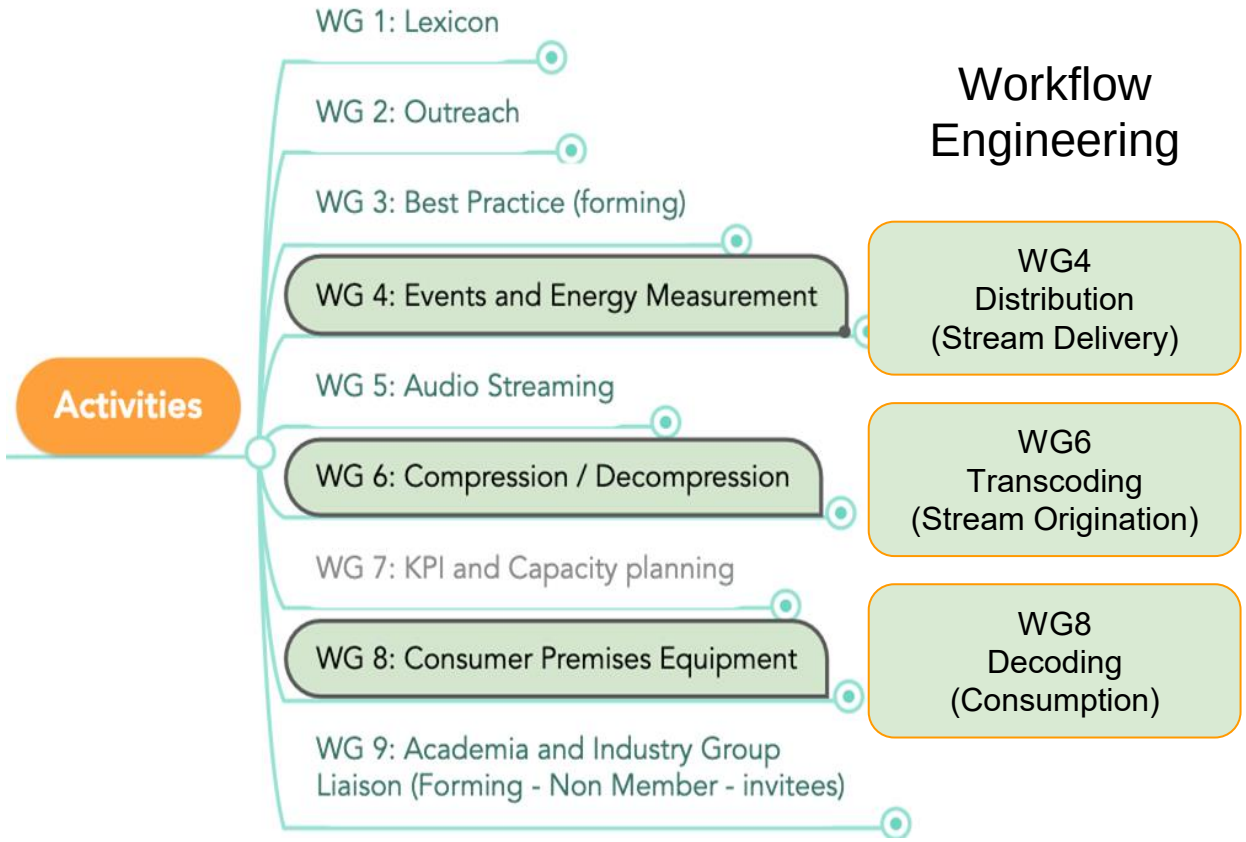


Impact of architectural choices on energy efficiency across the streaming content ecosystem.

Key Initiatives

Nine working groups and four LESS Accord projects aimed at Low Energy Sustainable Streaming.

- Working Groups: Members / Secretariat only. Closed. Periodic Publications.
- The LESS Accord Projects: Explore efficient distribution models, codec optimizations, and hardware & infrastructure optimization for energy efficiency through project work with the wider industry.



The Four LESS Accord Projects

1. **Intelligent Distribution Model Shifting**

   Can we switch between Unicast, P2P, Net Layer Multicast for the most energy efficiency, help CDNs seamlessly move among models, much the way a car shifts gears to optimize performance.

2. **‘Good Enough’ Codec / Ladder Configuration**

   Can we save energy through codec choices and optimisation and demonstrate real-world energy reduction while maintaining ‘good enough’ quality for audience consumption?

3. **Energy ‘Breadcrumb’ Metadata Stamps (to drive energy aware workflows)**

   Can we obtain energy info from streaming systems to intelligently determine workflow strategy based on ‘energy context’ and create a container / manifest layer control plane for such decisions?

4. **Hardware and Infrastructure Optimisation**

   Can we combine optimised silicon, immersion cooling, relocation etc. to move existing workloads (encoding / caching) to different hardware environments to realise significant energy efficiencies?

Membership

Benefits

- Networking and learning,
- Contributing to open-source energy strategy,
- Associating your brand with sustainability.
- Join a unified industry working on robust answers to these complex questions.

Commitment that members bring where they can:

- Contributions to Working Groups, monthly members' meetings, feedback on collective documents.
- Technical energy measurements where possible.
- Bring insights into the challenges of scale.
- Annual membership fee.

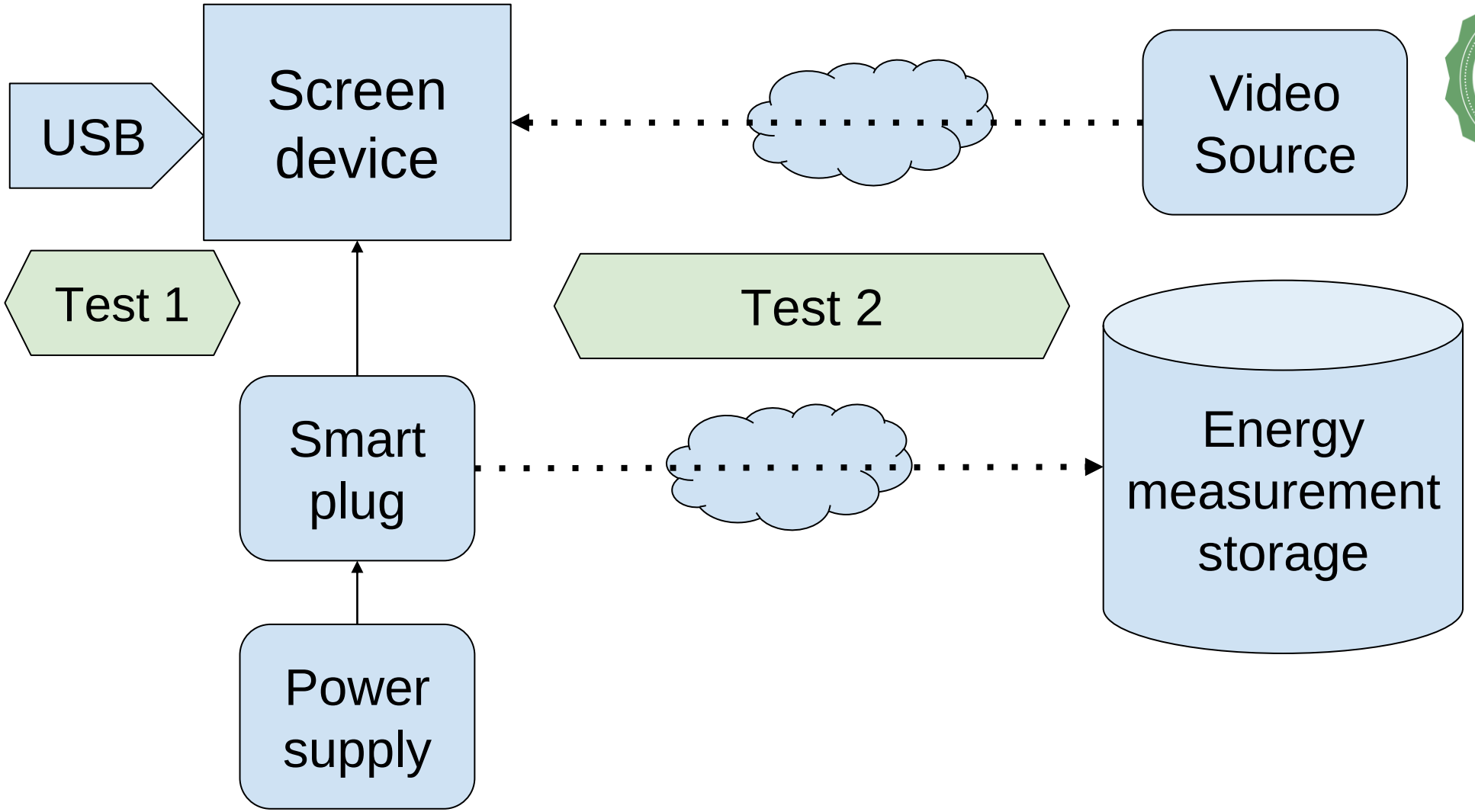
Ongoing
Remote Energy Measurement
Project

Where we are in Q1 and some 2024 plans

- Up and running
  - Real-time energy measurement and live graphing for up to several hundred simultaneous smart plugs
  - Each plug costs 9-15€, and set up is trivial (tester need not be tech savvy).
  - Experience with many TVs (ability to make them decode a test stream form a set URL)
  - A dedicated server at the University of Bristol with power measurement
  - A 30-minute loop maximising and minimising screen consumption, including HDR and SDR
  - Video marker signals to synchronize measurements
- In discussions for 2024
  - Use of a dedicated rack with a Tier 1 Cloud provider
  - Use of a dedicated rack with a Tier 1 CDN provider
  - Collecting & number crunching more test environment info (ambient light, OS versions etc.)

Some Early REM Feedback (Q1 / 2024)

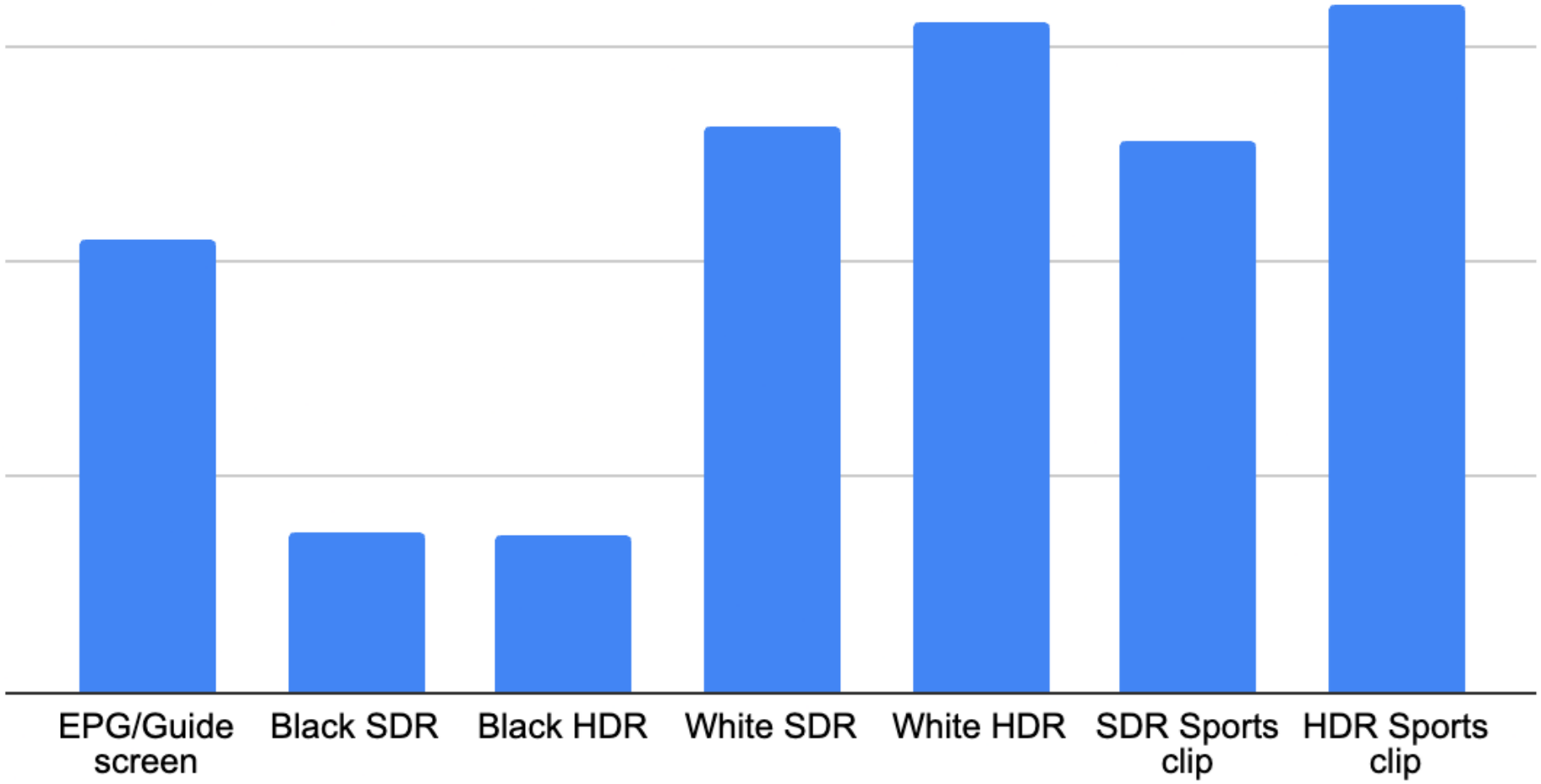
REM 1 & 2



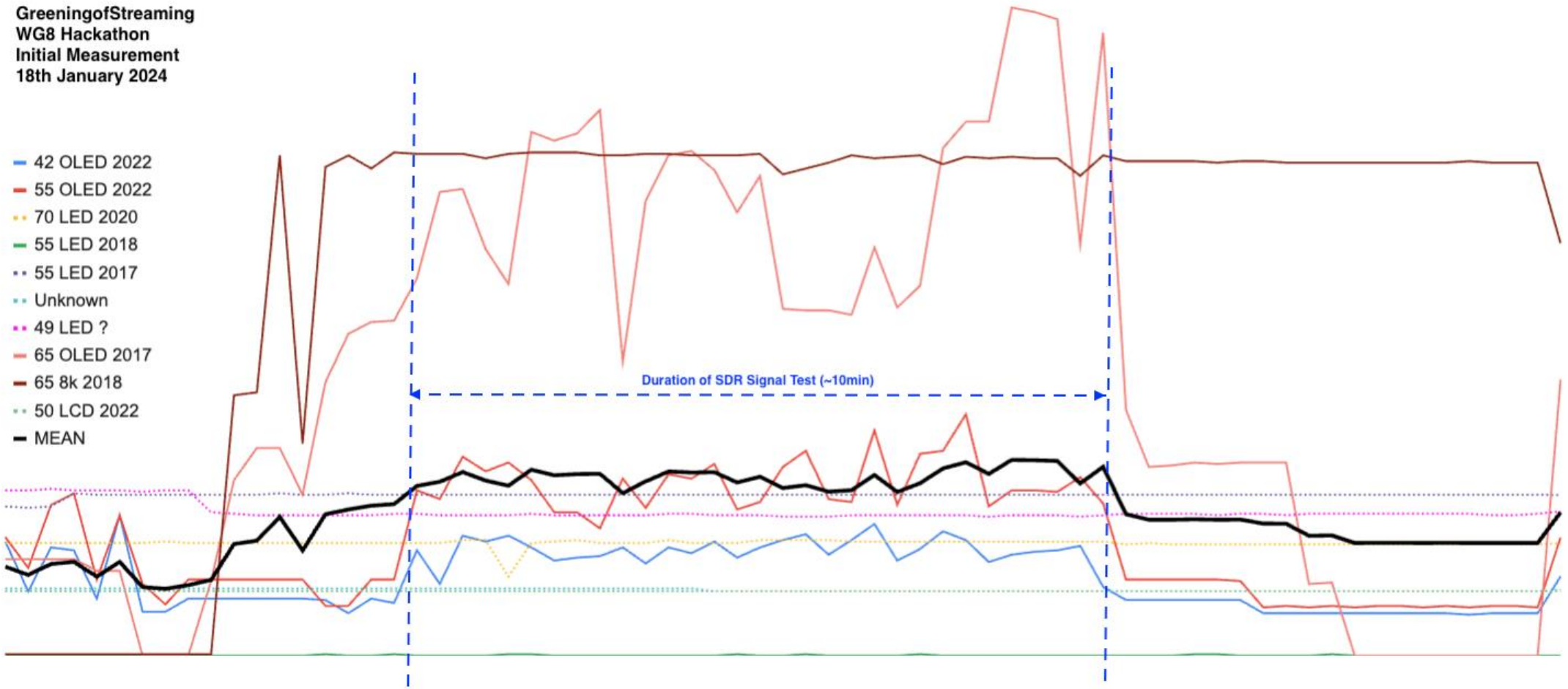
Tester’s home

GoS online resources

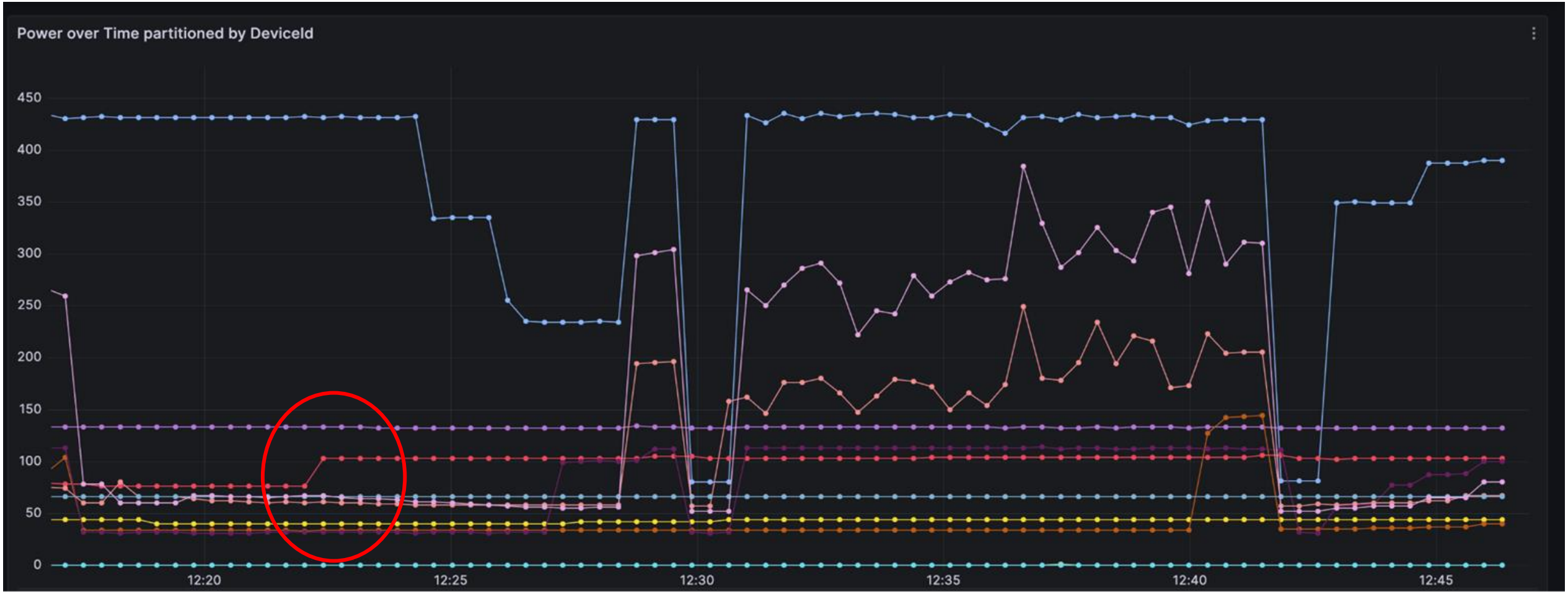
REM1 USB-stick results



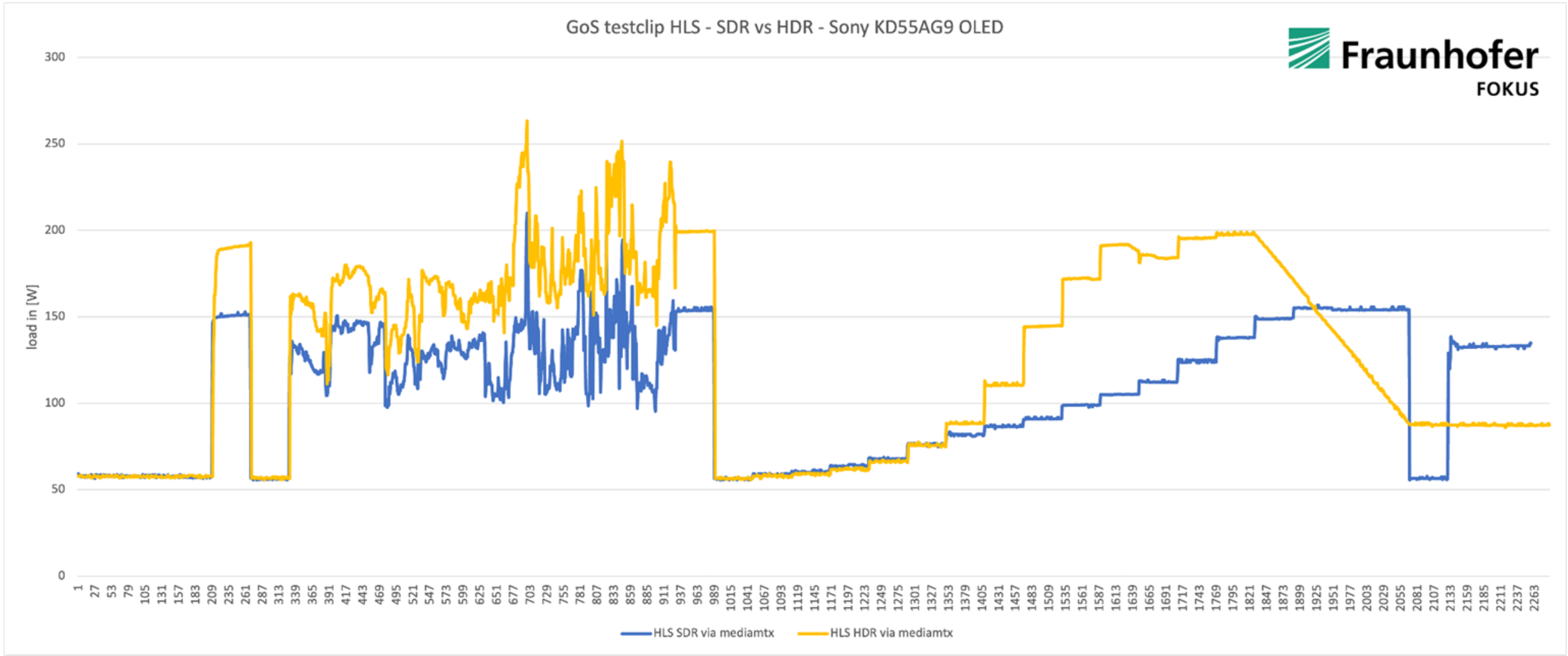
REM1 USB-stick results



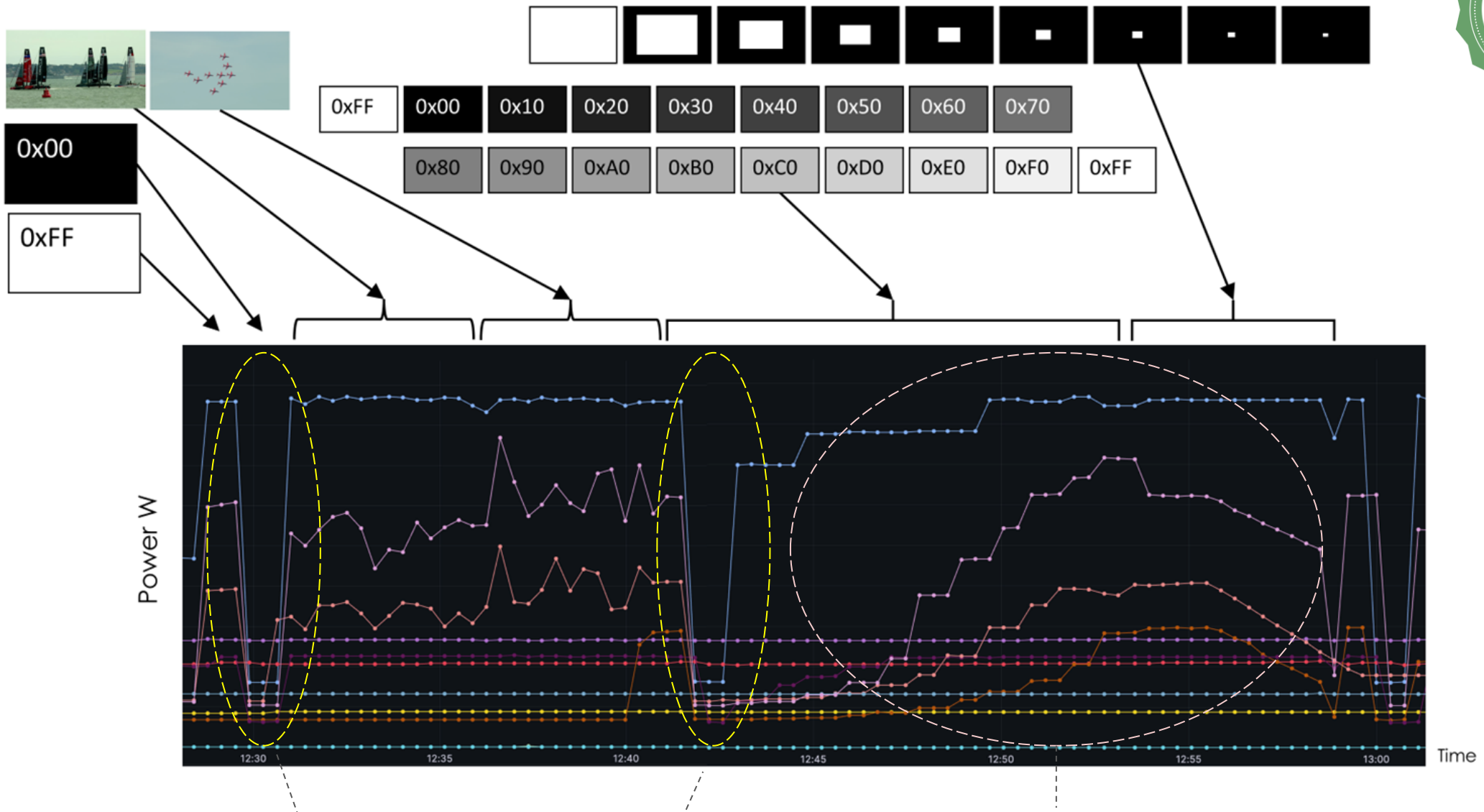
Streaming Results:
Example of Bad HDR Implementation



Calibrating our results with Lab equipment



Mapping Video Test Sequence to Energy Measurements



Some Preliminary Conclusions on REM (after just two hackathons)

- Proof of remote monitoring.
  - Marker signal works on the TV; what about elsewhere?
  - Segments must be 3x measurement interval
- Scalability is already in the hundreds, with thousands on the horizon.
- Streaming Setup & Video Playback can be challenging.
- Either gather information on test conditions (ambient light, TV settings, etc.), or use a large enough sample (but how large)?
- Testing a typical TV creates power variations of 80-100W per household.