

Fighting Hardware Obsolescence With Greener Frontend Code

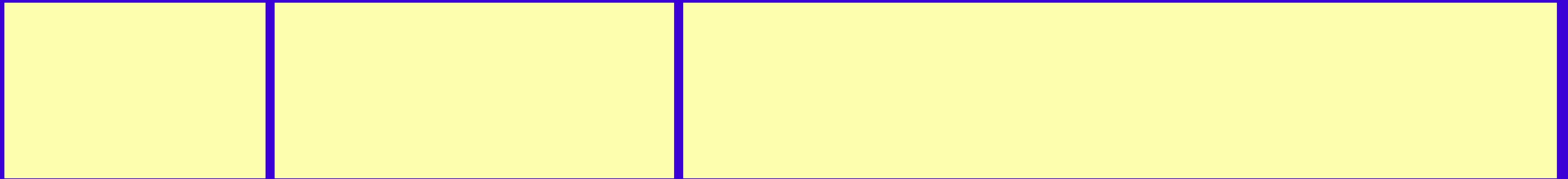
Dr. Björn Ganslandt

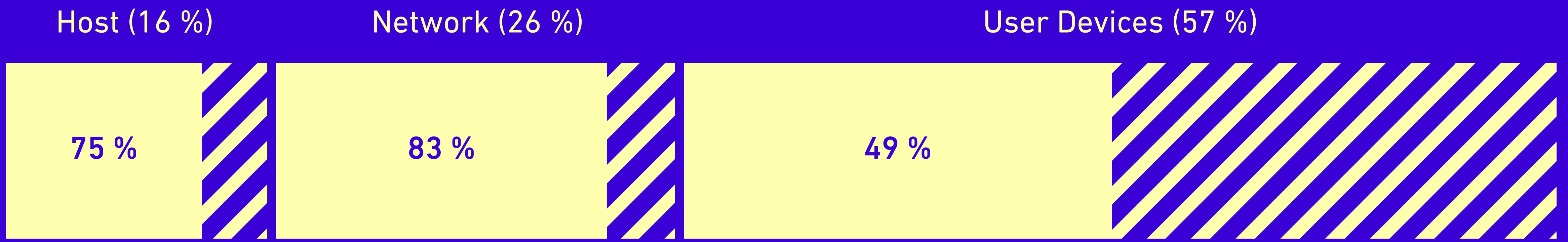
Every Sustainability Talk
Starts With Statistics

Host (16 %)

Network (26 %)

User Devices (57 %)

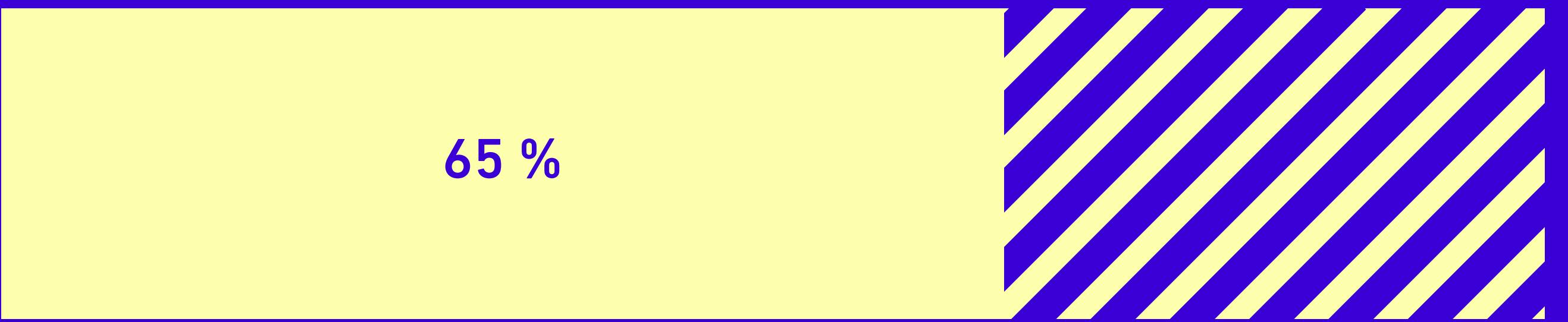




- Use Stage
- ▨ Embodied

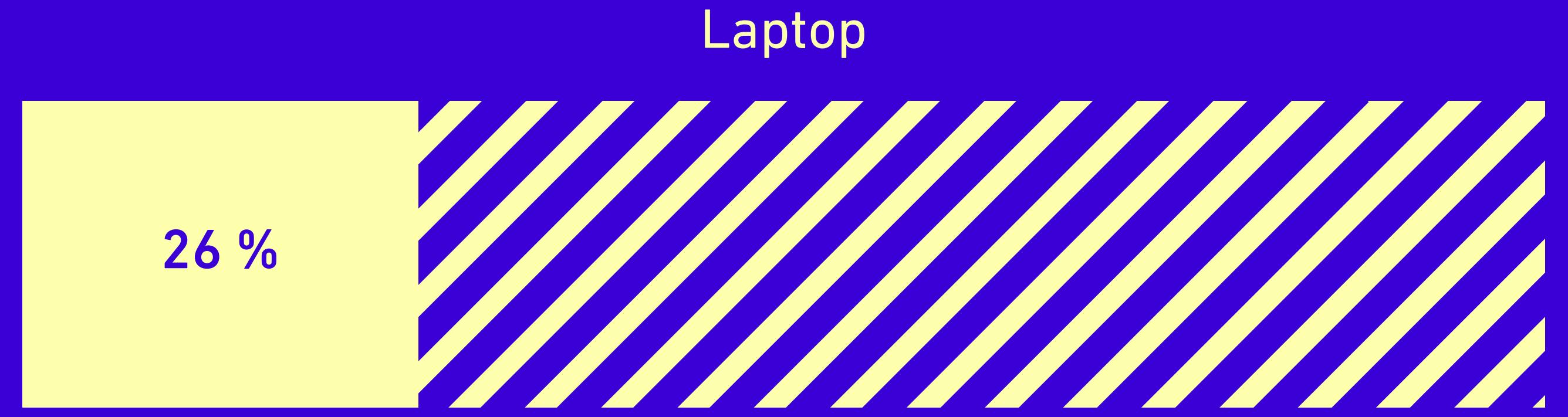
Desktop PC + Screen

65 %



■ Use Stage

// Embodied



■ Use Stage

// Embodied



■ Use Stage

▨ Embodied

Every Discussion About
Device/Browser Support
Starts With Statistics

Older Devices

I



Modern Devices

Humanize Users on Older Devices With Support Tickets

Make Testing and Development
Dirt Cheap

Don't Test Every Feature,
But Test Regularly

Make It Work,
Don't Make It Perfect

How To Test Old Hardware

Emulation

iOS Simulator Comes Free
With Macs
(Which Are Decisively Not Free)

Safari

The screenshot shows a mobile web page for the ecoCompute conference. At the top, it says "iPhone 12" and "iOS 15.5". The main content area has a purple header with white text: "and delivers inspiration to enable the most sustainable solutions." Below this, there are two reviews:

- David Kopp** from Envite Consulting: "ecoCompute is the best conference for learning best practices for greening IT and networking with like-minded people."
- Max Schulze** from SDIA: "What an amazing audience! During my talk about values and"

The developer tools are open, showing the DOM tree and CSS styles for the "review" element. The DOM tree shows the structure of the page, and the CSS panel shows the styles applied to the "review" element, which is highlighted in blue.

```
<div class="review"> = $0
  <div>
    "ecoCompute is the best conference for learning best practices for greening IT and networking with like-minded people."
  </div>
</div>
```

Selected CSS rule: .review { color: #fff; }

Android Simulator Is Free
Everywhere

Emulator

Android Emulator - Pixel_7:5554

1:21 eco-compute.io

ecoCompute

ecoCompute conference

13 & 14 November 2025

bUm - Berlin, Germany

The biggest

Compute
Tap to see search results

DevTools - www.eco-compute.io/

Elements Console Sources Network Performance

```
<!DOCTYPE html>
<html lang="en-us">
  <head>@@</head>
  <body>
    <!-- preloader start -->
    <div class="preloader" style="display: none;"></div>
    <!-- preloader end -->
    <header class="header-bar">@@</header>
    <section id="first-section" class="section-banner d-flex align-items-center">
      <div class="container">
        <div class="row" flex>
          <div class="col-lg-7 mr-auto">
            <div class="banner-content">
              <h1 class="mt-3 mb-5">
                <span class="bold">eco</span>
                <span class="slim">Compute</span> == $0
                " conference"
              </h1>
              <h2>13 & 14 November 2025</h2>
              <h3 class="primary-color">@@</h3>
            </div>
          </div>
        </div>
      </div>
    </section>
    <br>
    <br>
    <section class="cta-wrap" style="padding: 0; text-align: right;">@@</section>
    <section class="overflow-hidden counter-wrapper pt-4 pb-5">@@</section>
    <section id="section-newsletter" class="overflow-hidden counter-wrapper pt-4 pb-5">@@</section>
  </body>
</html>
```

Styles Computed Layout Event Listeners DOM Breakpoints Properties Accessibility

Filter :hov .cls +

```
element.style { }

@media (max-width: 767px)
  .section-banner .banner-content h1, .section-banner .banner-content h1 span {
    font-size: 50px;
  }

@media (max-width: 991px)
  .section-banner .banner-content h1, .section-banner .banner-content h1 span {
    font-size: 80px;
  }

.section-banner .banner-content h1, .section-banner .banner-content h1 span {
  font-size: 100px;
  line-height: 1.2;
  letter-spacing: -.04em;
}
```

Browserstack

★ Favourites (11/12)		Real Devices (39)					
⌚ Recent Tests [New]		Iphone ▾					
iOS		✖ No SIM		📱 With SIM			
ANDROID		★ iPhone 15	17	★ iPhone 16 Plus	18	★ iPhone 13 Pro Max	15
Windows		★ iPhone 14	16	★ iPhone 16 Pro Max	18	★ iPhone 14 Pro Max	16
11		★ iPhone 13	15	★ iPhone 12 Pro	18	★ iPhone 12 Pro Max	16
10		iPhone 12	14	★ iPhone 14	18	★ iPhone 15 Pro	17
8.1		★ iPhone 11	13	★ iPhone 13 Pro Max	18	★ iPhone 12 Pro	14
8		★ iPhone 16	18	★ iPhone 13	18	★ iPhone SE 2022	15
7		★ iPhone Air	26	★ iPhone 15 Pro Max	17	★ iPhone SE 2020	16
XP		★ iPhone 17	26	★ iPhone 14 Plus	16	Show 5 More Devices	
Mac	+	★ iPhone 17 Pro	26	★ iPhone 13 Pro	15		
		★ iPhone 17 Pro Max	26	★ iPhone 14 Pro	16		
		★ iPhone 14 Pro	26	★ iPhone 15 Plus	17		
		★ iPhone 15	26	★ iPhone 13	17		
		★ iPhone 14	26	★ iPhone 12	17		
		★ iPhone 15 Pro Max	26	★ iPhone 12 Pro	17		
		★ iPhone 16e	18	★ iPhone 13	16		
		★ iPhone 16 Pro	18	★ iPhone 13 Mini	15		

💬 Talk to an Expert

Go Buy Old Hardware
(It's Not That Expensive)

It's Broken – Now What?

Check Your Browserlist

package.json

```
"browserlist": [  
  "defaults, last 5 years, not dead",  
]
```

94,8 %

Global Coverage

<https://browserslist/#q=defaults%2C+last+5+years%2C+not+dead>

Progressive Enhancement in CSS

Overloading

```
.selector {  
    height: 100vh; /* Ignored by new browsers */  
    height: 100dvh; /* Ignored by old browsers */  
}
```

@supports

```
.selector {  
  @supports (animation-timeline: scroll()) {  
    animation: bounce linear both;  
    animation-timeline: scroll(x);  
  }  
}
```

Progressive Enhancement in JS

Fallbacks

```
const uuid = crypto.randomUUID?.() ||  
  Date.now().toString() +  
  Math.random().toString(16);
```

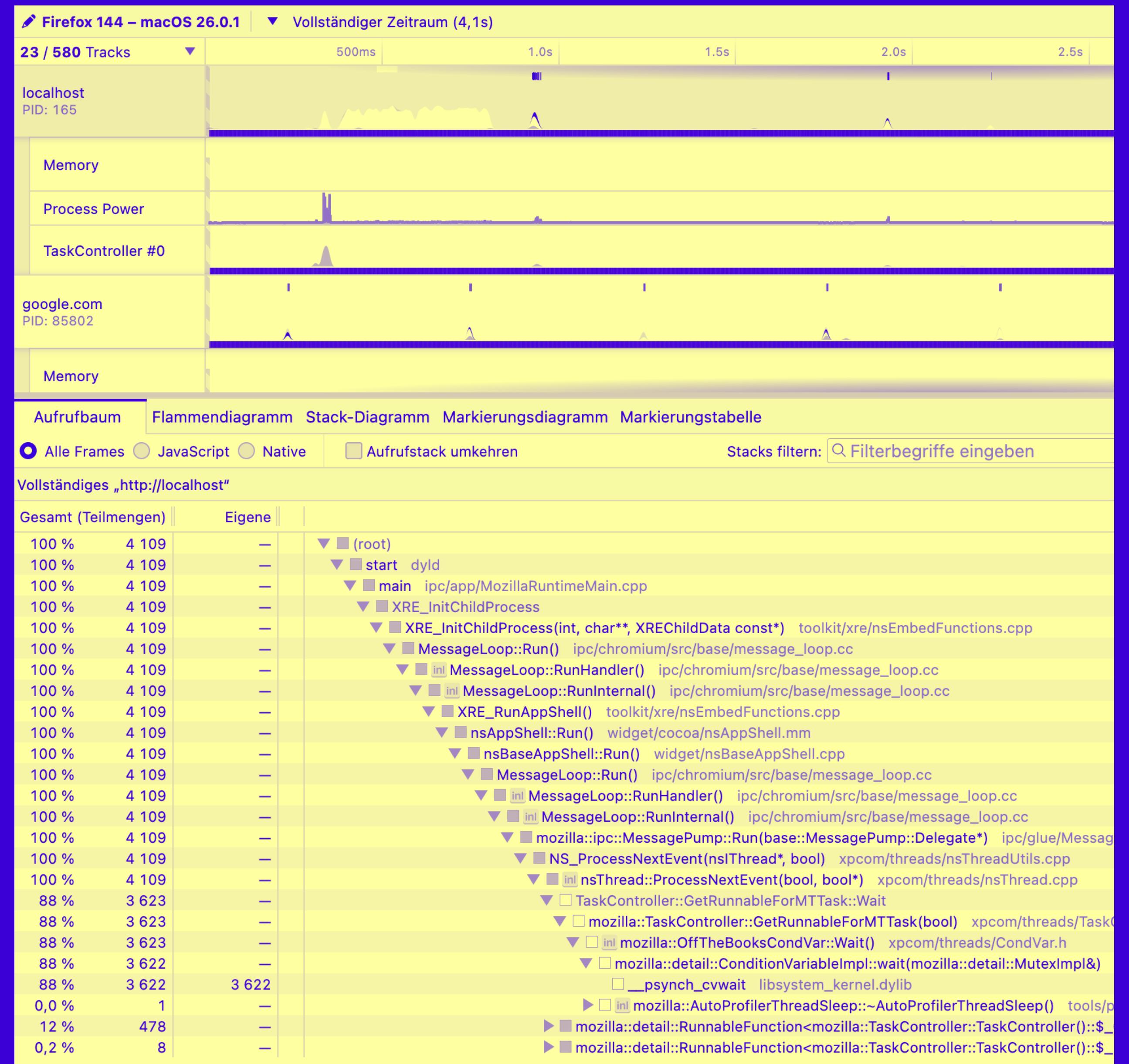
Cutting the (Mini-) Mustard

```
const isModernBrowser =  
  typeof Array.fromAsync === "function";
```

It's Slow – Now What?

Optimize for Runtime Behaviour

Devtools



Devtools

The screenshot shows the Chrome DevTools interface with the following details:

- Top Left:** A sidebar displays GPU metrics: Frame Rate (58.2 fps), GPU raster (on), and GPU memory (45.2 MB used / 1629.5 MB max).
- Top Center:** A large yellow banner for "Sustainability in hardware & software" with a "FIND OUT MORE" button.
- Middle:** A yellow box displays a conference countdown: 17 Days, 14 Hours, 51 Minutes, and 49 Seconds.
- Bottom:** The DevTools navigation bar includes tabs for Elements, Recorder, Console, Sources, Network, Performance, Memory, **Application**, Privacy and security, Lighthouse, Angular, Apollo, and Redux.
- Application Tab Content:** Shows the "Manifest" file under the "Console" section. It includes four rendering options:
 - Paint flashing:** Checked, highlights green areas.
 - Layout shift regions:** Unchecked, highlights blue shifted areas.
 - Layer borders:** Checked, shows orange/olive layer borders and cyan tiles.
 - Frame Rendering Stats:** Checked, plots frame throughput, dropped frames distribution, and GPU memory.

Disable Some Features for Older Devices

```
> navigator.deviceMemory
```

```
8
```

```
> navigator.hardwareConcurrency
```

```
8
```

```
> navigator.connection.saveData
```

```
true
```

```
> const battery = await navigator.getBattery()

{
  charging: false
  chargingTime: Infinity
  dischargingTime: 14400
  level: 0.73
}
```

Thank You!

Any Questions?

Sources

Malmodin, J., Lövehagen, N., Bergmark, P. and Lundén, D. (2024).

ICT sector electricity consumption and greenhouse gas emissions – 2020 outcome. *Telecommunications Policy*, [online] 48(3), p.102701. doi:<https://doi.org/10.1016/j.telpol.2023.102701>.