

U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

ADVANCED MATERIALS &
MANUFACTURING
TECHNOLOGIES OFFICE



Day 2 Opening EES2 Workshop #8

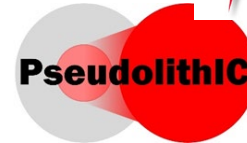
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EES2 Workshop Co-Chair

July 20, 2023



<https://microelectronics.slac.stanford.edu/amo-microelectronics>

WELCOME Iris Light Technologies —Our 50th Pledger!



Overview



Lessons Learned

- Identifying Problem Leads to Solution
- Compromise is often necessary
- Anything Super-expensive is likely an energy efficiency opportunity

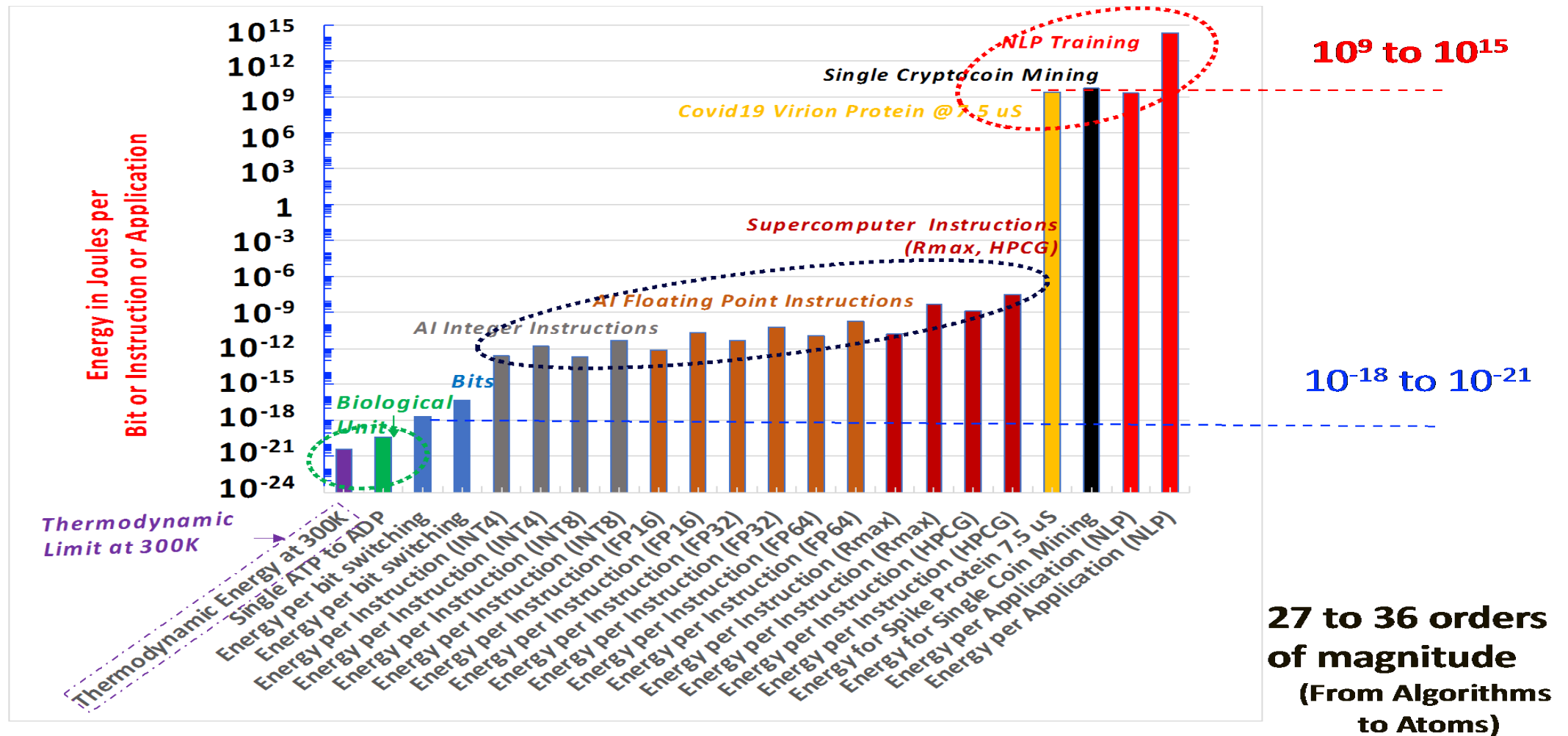
To do from Yesterday

D. Proposed Roadmap Chapters (> per Working Group)

E. EES2 Secretariat Activities (Recruitment (we need YOU to help!), Redesigned webpage, Newsletter, Wikipedia, Book Club)

Identifying Problem Leads to Solution

Sadas' Seminal Analysis from Bits to Bitcoin



Anything Super-expensive is likely an energy efficiency opportunity

- Data Centers
- EDA/PDK

Corollary—identifying super expensive problems that you can solve with energy efficiency is a great industry recruitment tool

D. EES2 Roadmap Proposed Chapters (Draft)



1. Introduction and Overview

2. Materials & Devices (MnD)

3. Circuits & Architectures (CnA)

4. Advanced Packaging & Heterogeneous Integration (AP/HI)

5. Algorithms & Soft (AnS)

6. Power and Control

Electronics (PACE,

7. Metrology & Benchmarking (MnB)

8. Manufacturing Energy Efficiency and Sustainability (MEES)

9. Optics and “other topics that Crosscut more than 3 WGs (XCUT)

10. Microelectronics Education and Workforce Development (MEWD)



D. EES2 Secretariat Thought Leadership to do list (draft)

1. **NEED for Energy Efficiency (A, O)**
 - In general (update of SRC?? Add MEES input)
 - in Artificial Intelligence
 - In Clean Energy Applications
2. **How EES2 builds on Microelectronics History (S, C)**
3. **Why 1,000,000X is possible (A, O) (build on Sadas)**
4. **Definition of Energy Efficiency Scaling (A, WG)**
5. **Link between the environmental (GHG) and other public benefits (e.g. competitiveness) of EES2. (A, P)**
6. **Technology Scenarios for 10x, 100x and 1000x goal (WG, A, C)**
7. **Agency by agency link between mission and importance of energy efficiency starting with DOE! (WG, A)**
8. **Beyond R&D (D&D) policies that can increase efficiency (P, A)**
9. **Overall Roadmap message including chapters not covered by WG (S, A, C, P)**



Thank you!

Q&A and Discussion