



**Beam**  
**Initiative**



# Introducing The eBeam Initiative

**20 Charter Members & Advisors Across the Ecosystem**

**Jan Willis**  
**eBeam Initiative Facilitator**

## Member Companies & Advisors



**ADVANTEST**



**cadence**



Marty Deneroff  
D. E. Shaw  
Research

**DNP**  
Dai Nippon Printing



**FASTRACK**  
DESIGN



Jack Harding  
eSilicon

**FUJITSU**



**MAGMA**



Colin Harris  
PMC-Sierra



**TOPPAN**

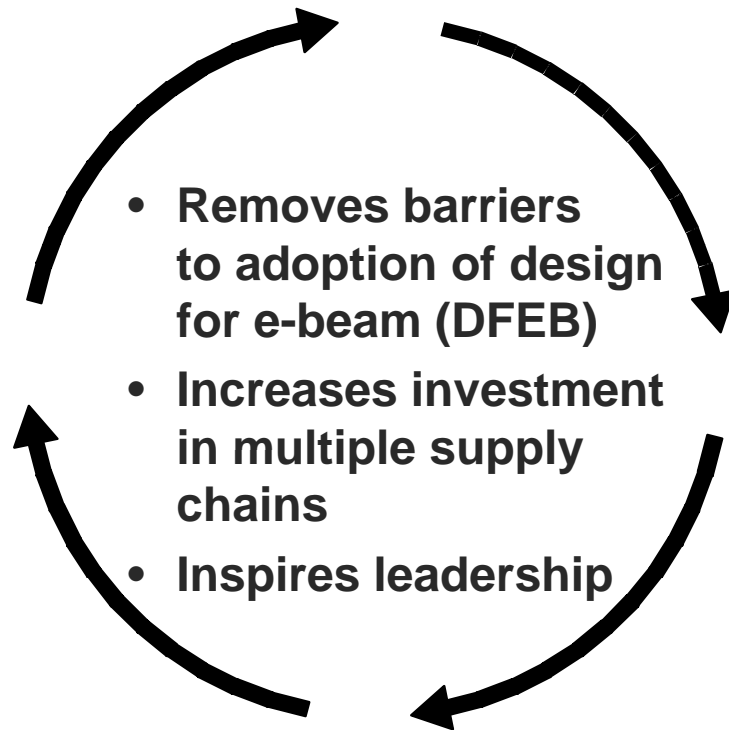


Riko Radojic  
Qualcomm



Jean-Pierre Geronimi  
STMicroelectronics

# Why Industry Collaboration?



**More designs,  
Faster  
Time to Market**



# eBeam Initiative Roadmap



Initiative Launch	Design Proven	DFEB Certification
<ul style="list-style-type: none"><li>• &gt;10 members, advisors</li><li>• Website and papers</li></ul>	<ul style="list-style-type: none"><li>• 65-nm test chip</li><li>• Methodology guide</li><li>• 45-nm test chip</li></ul>	<ul style="list-style-type: none"><li>• Design certification training</li></ul>



**Semi-annual member meetings with advisors**

Manufacturability Proven	Multiple Chip Suppliers
<ul style="list-style-type: none"><li>• 65-, 45-nm and 32-nm proof points</li><li>• On-going effort for each node</li></ul>	<ul style="list-style-type: none"><li>• Design kit availability</li><li>• Equipment readiness</li></ul>



# Today's Agenda



## Industry Need for DFEB

Aki Fujimura, CEO - D2S, Inc.  
Managing Sponsor – eBeam Initiative

## Fujitsu Viewpoint

Shinichi Machida, President and CEO - Fujitsu Microelectronics America  
Steering Group – eBeam Initiative

## eSilicon Viewpoint

Jack Harding, Chairman and CEO - eSilicon Corporation  
Design Team Advisor – eBeam Initiative

## Summary and Q&A

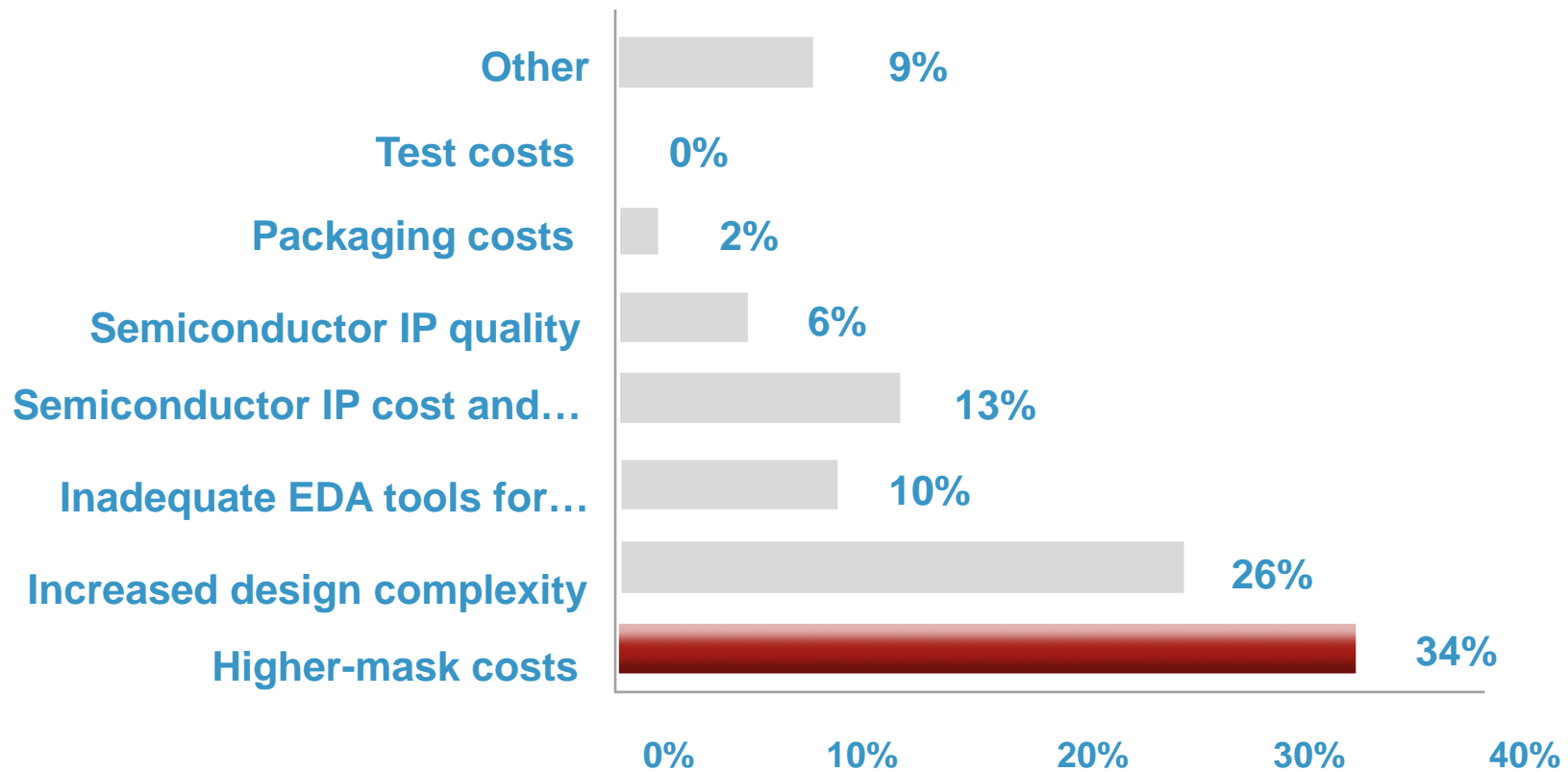




# Industry Need for DFEB

Aki Fujimura  
CEO - D2S, Inc.  
Managing Sponsor - eBeam Initiative

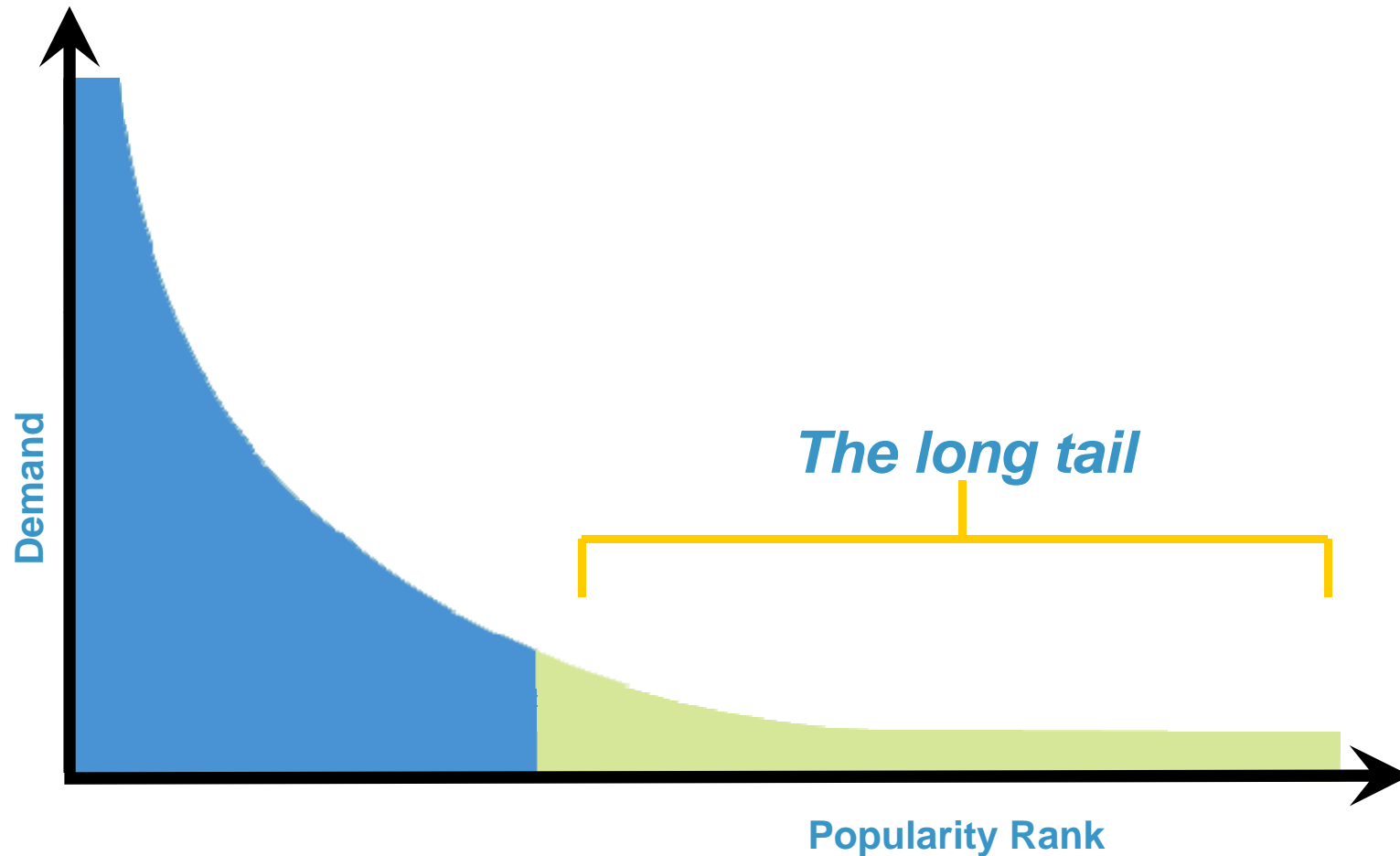
# Mask Cost is Top Concern



Source: Global Semiconductor Association (GSA) member survey, December 2007

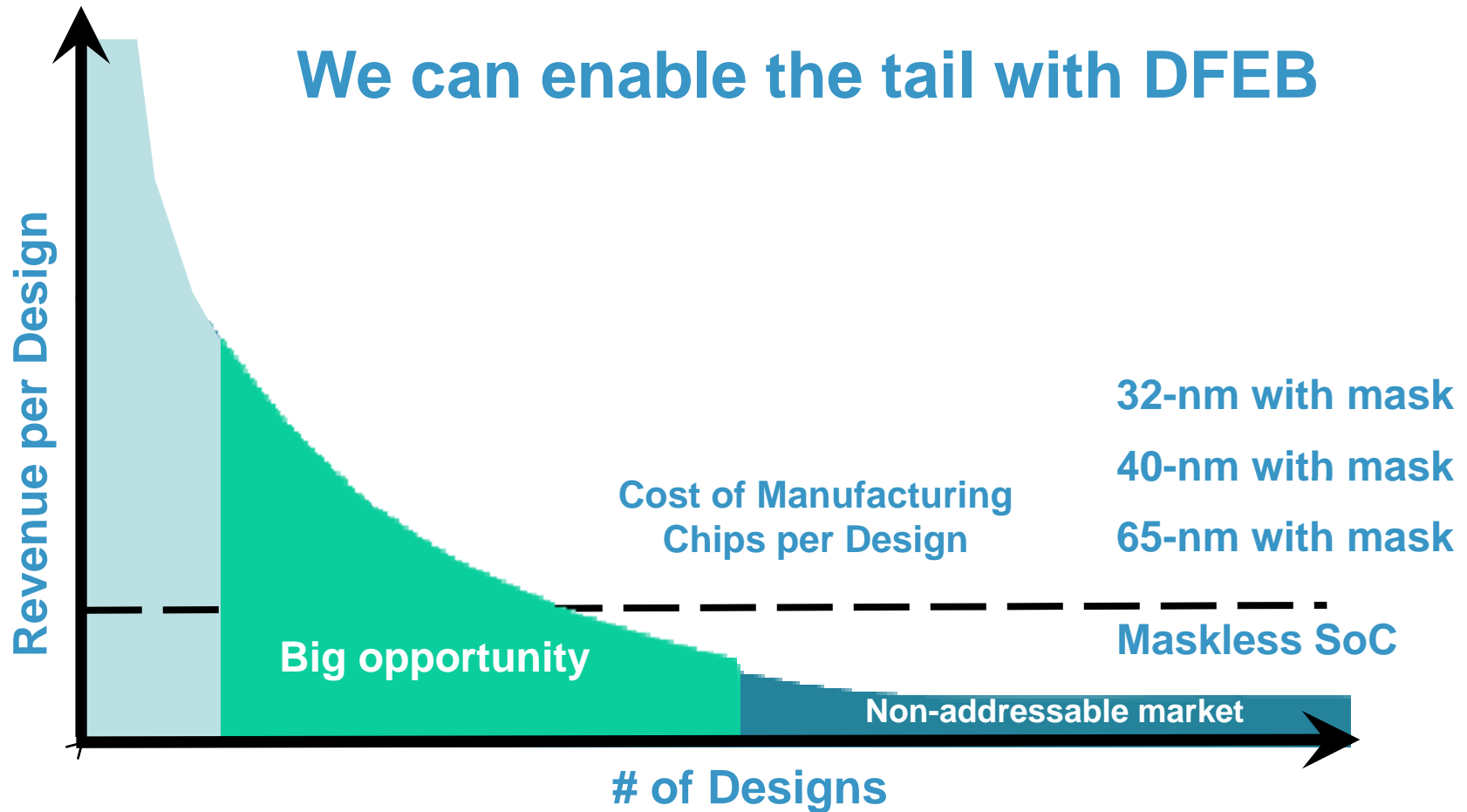


# Enabling the Long Tail of SoCs



Source: Chris Anderson's "The long tail: Why the future of business is selling less of more"

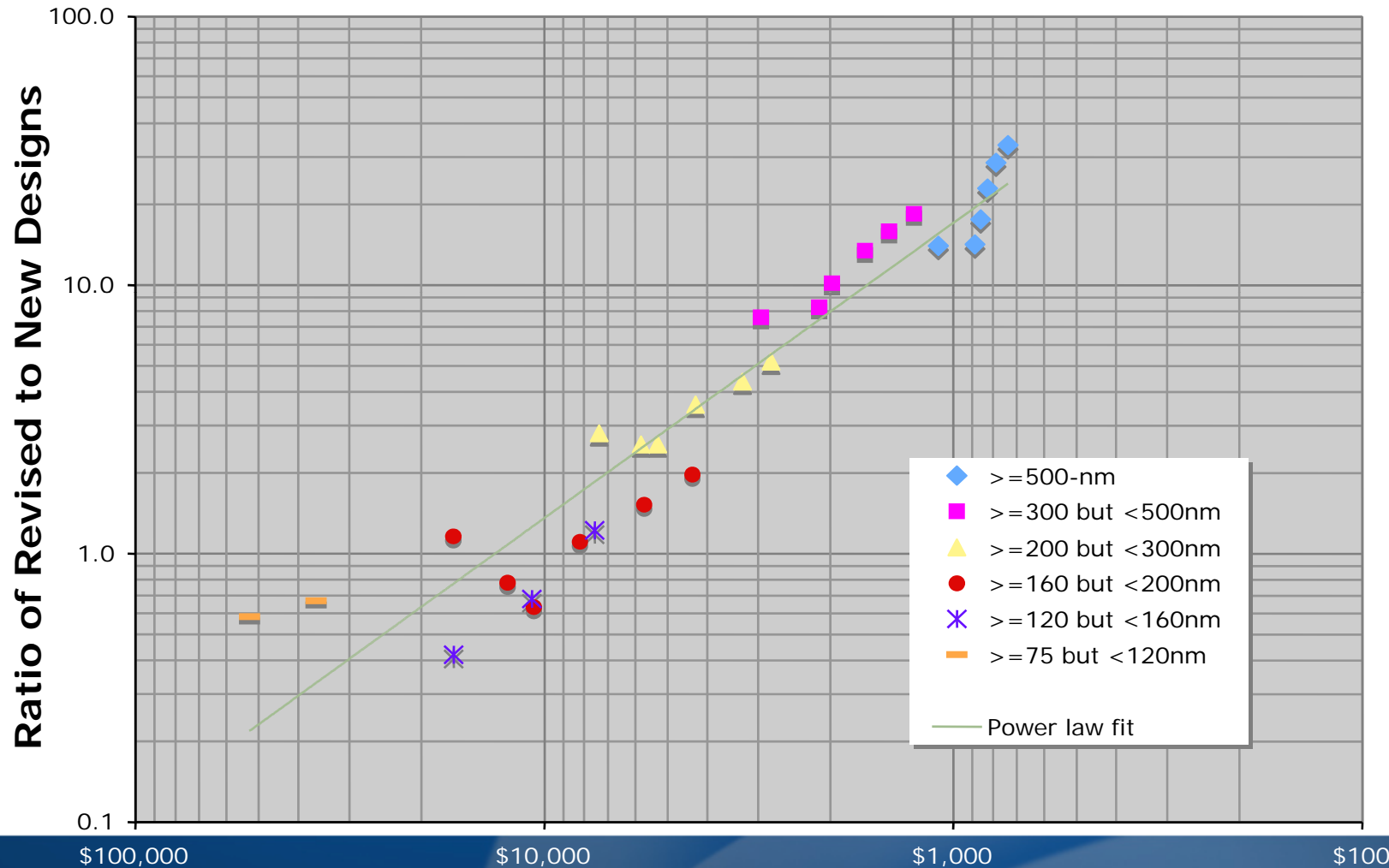
# The Tail is Getting Shorter



# The Derivatives Opportunity



## 10x reduction in mask cost increases derivatives by 10x



Reticle ASP

# Fast EbDW using CP



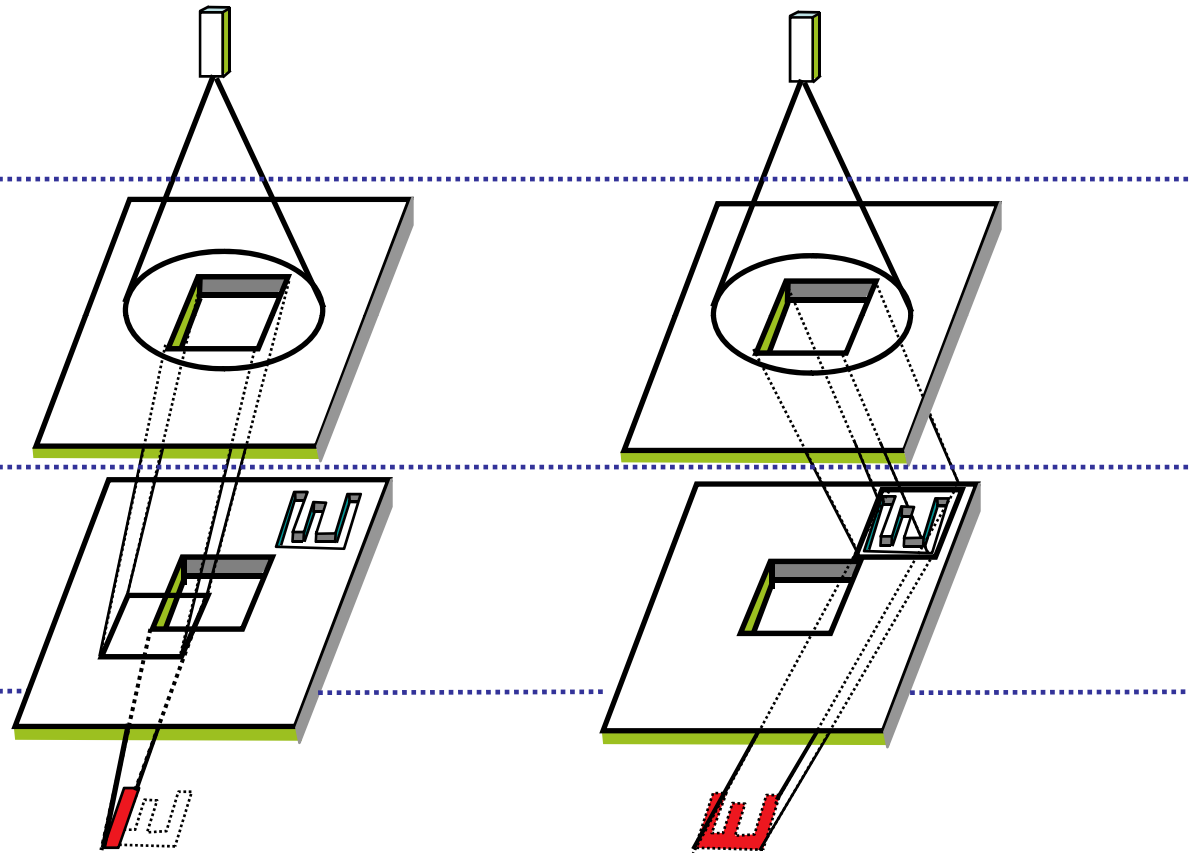
Available today and uniquely effective at and below 65-nm

ELECTRON GUN

1<sup>ST</sup> - APERTURE

2<sup>ND</sup> - APERTURE

DEMAGNIFICATION

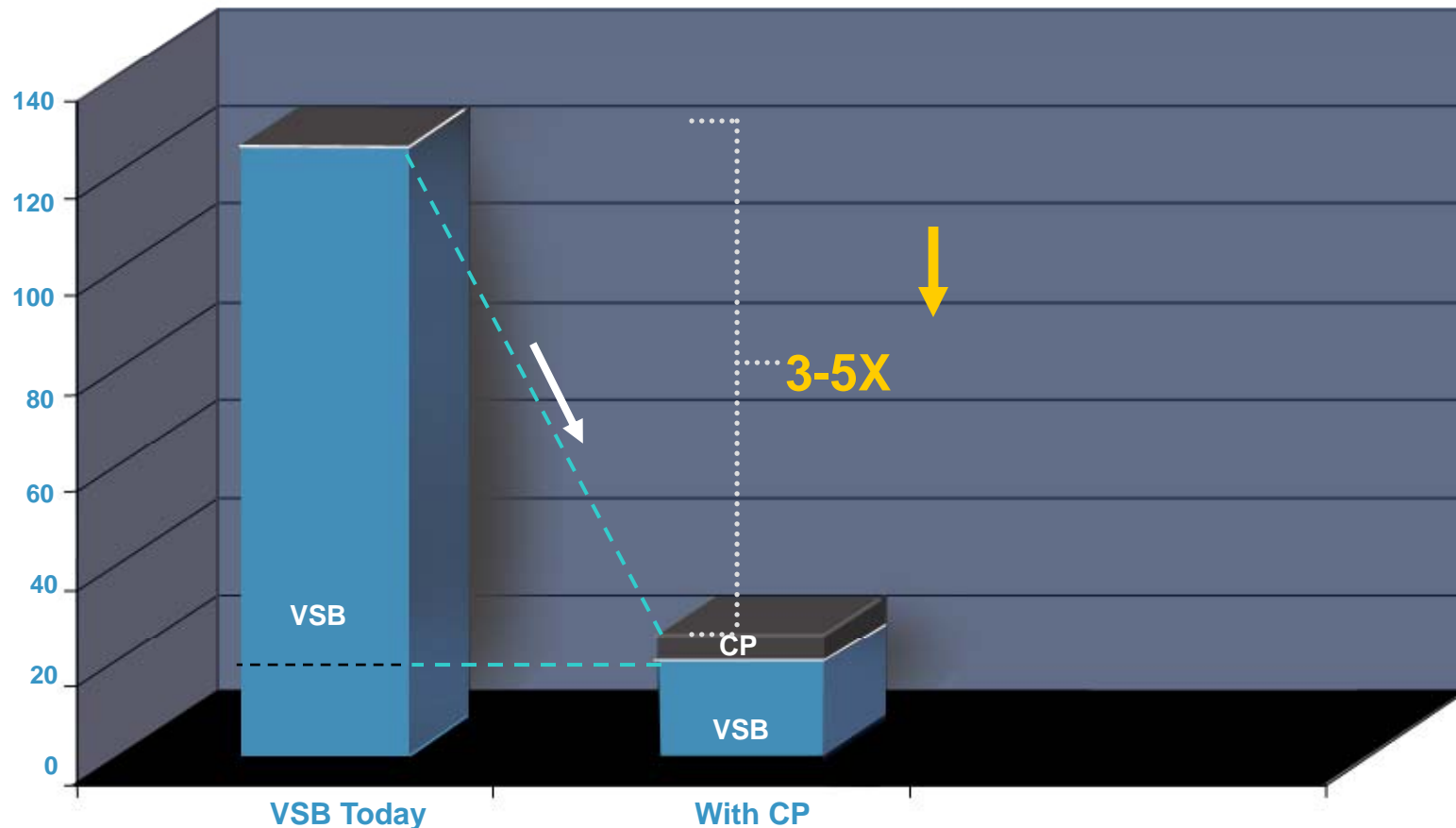


(A) VSB: Variable Shaped Beam

(B) CP: Character or Cell Projection

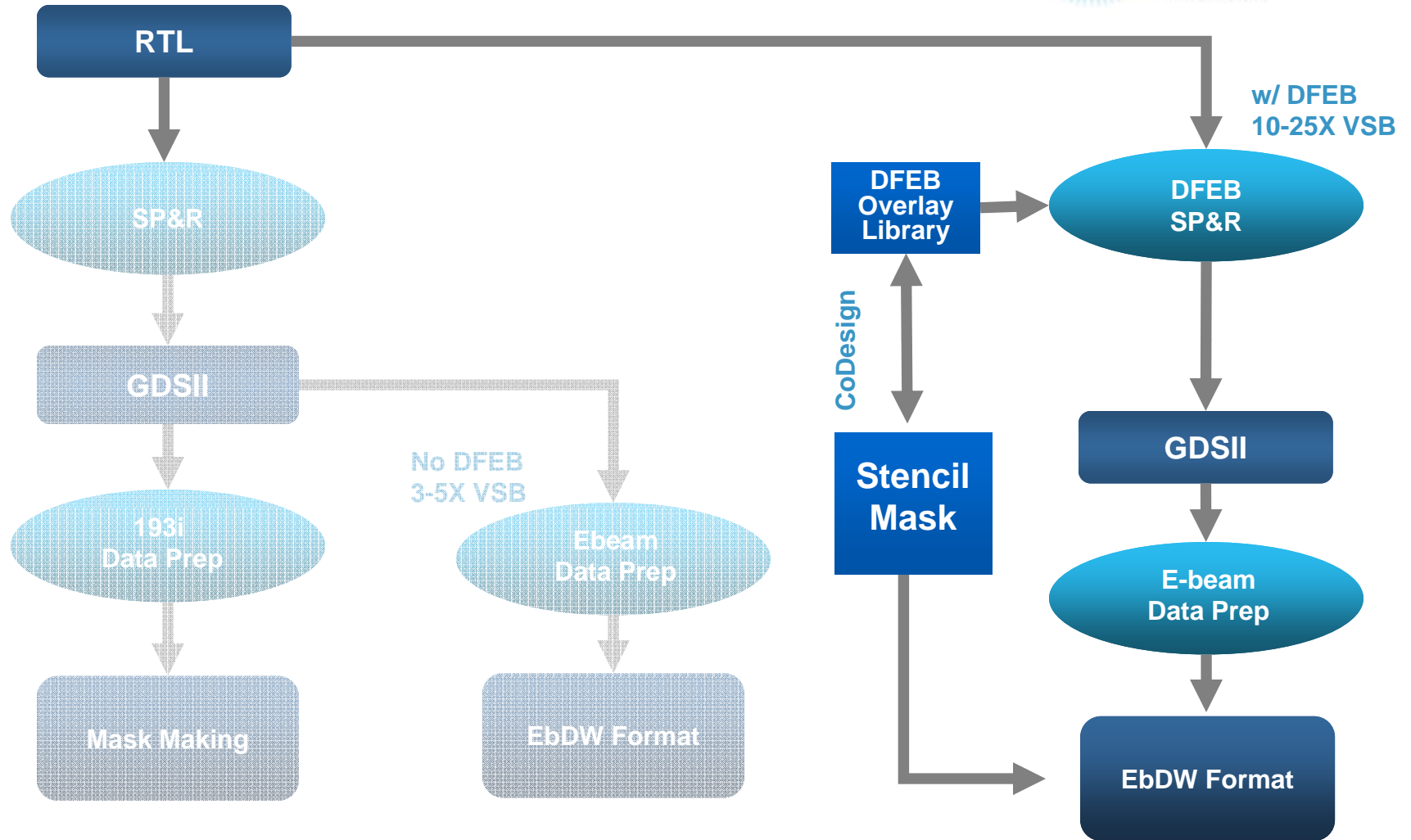
Drawing Courtesy Hitachi High-Technologies

# EbDW Underutilized Even with CP due to throughput



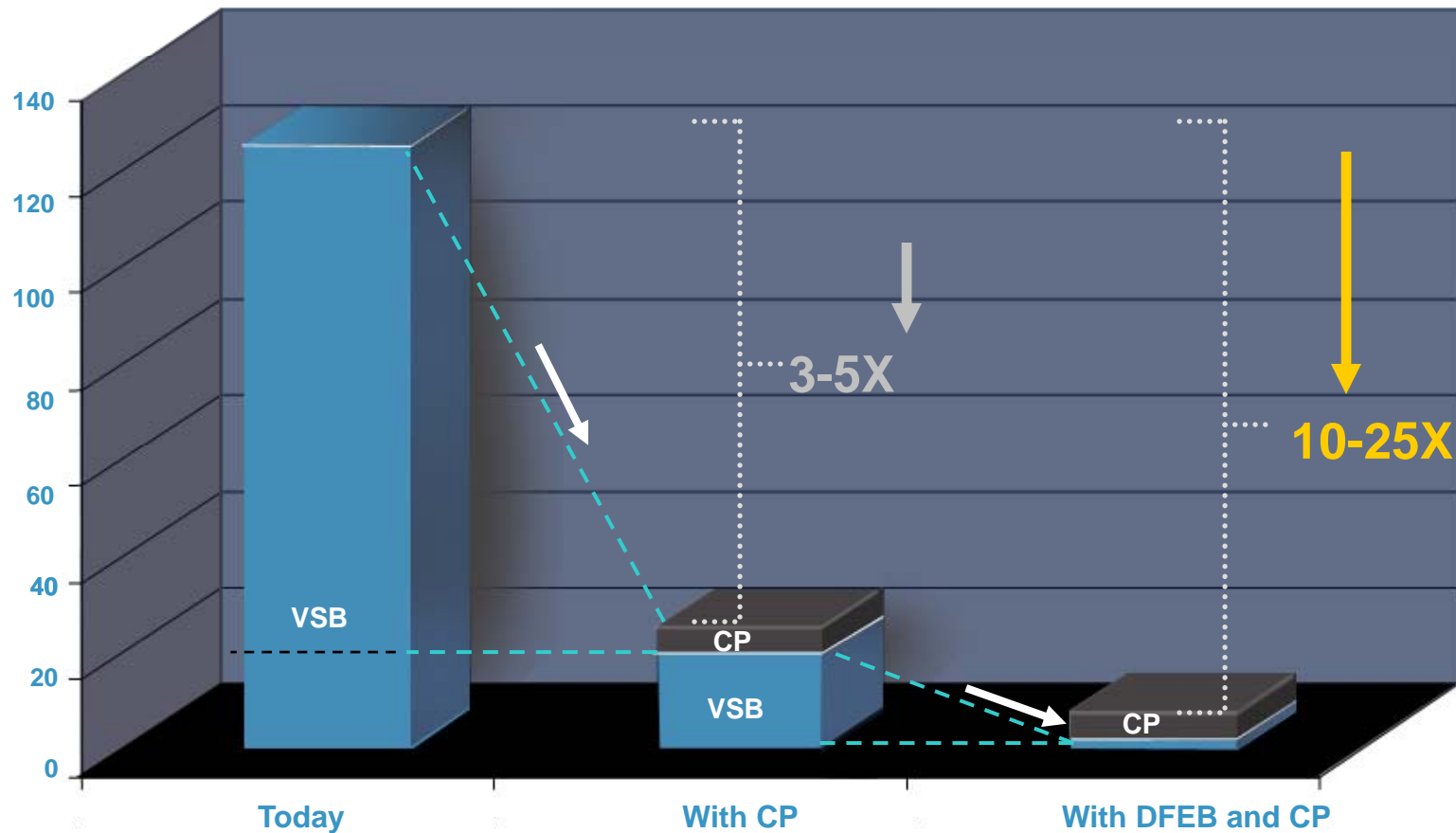
Comparison Source: D2S Computer simulation of e-beam write time on a particular test case (speed up is dependent on aperture size and utilization %)

# DFEB Starts with Design



# DFEB Breakthrough

## Makes CP EbDW practical for low volume



Comparison Source: D2S Computer simulation of e-beam write time on a particular test case (speed up is dependent on aperture size and utilization %)

# Collaboration Already Underway



- **Fujitsu, e-Shuttle and D2S to Prove DFEB Design and Manufacturing**
- **65-nm low-power test chip**
- **Announced October 2008**

*Pictured are (left to right) **Dr. Haruo Tsuchikawa**, President of e-Shuttle, **Hiroyuki Asahida**, Director of Marketing at Fujitsu Microelectronics, and **Aki Fujimura**, Chairman and CEO of D2S.*

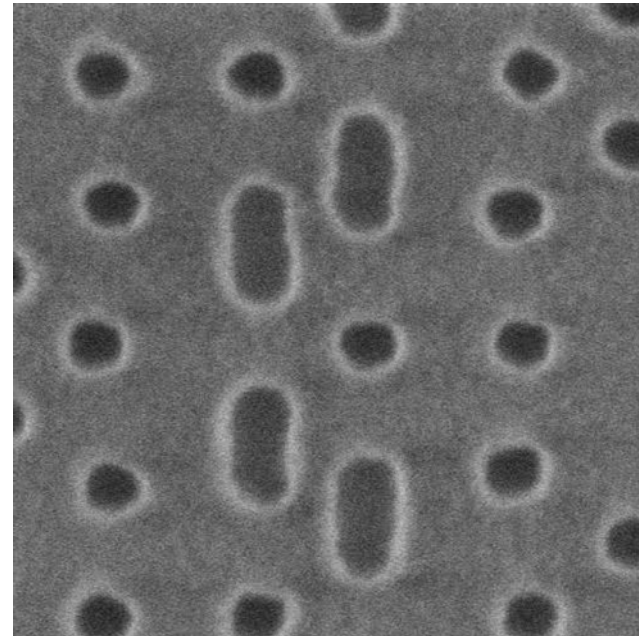




# Today's Proof Point at SPIE



- **CEA/Leti, Advantest, and D2S joint paper at 2:20 p.m., Session 5: EBDW**
- **Manufacturing proof of accurate CP projection for 32-nm contacts**



# Summary of Today's News



- 20 charter members launch the eBeam Initiative
- Initiative roadmap established
- Execution already underway
- Design test chip in 2009
- Today's SPIE paper proves manufacturability at 32-nm
- With DFEB, direct write has arrived

## Member Companies & Advisors



**ADVANTEST**<sup>®</sup>



**cādence**<sup>™</sup>



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