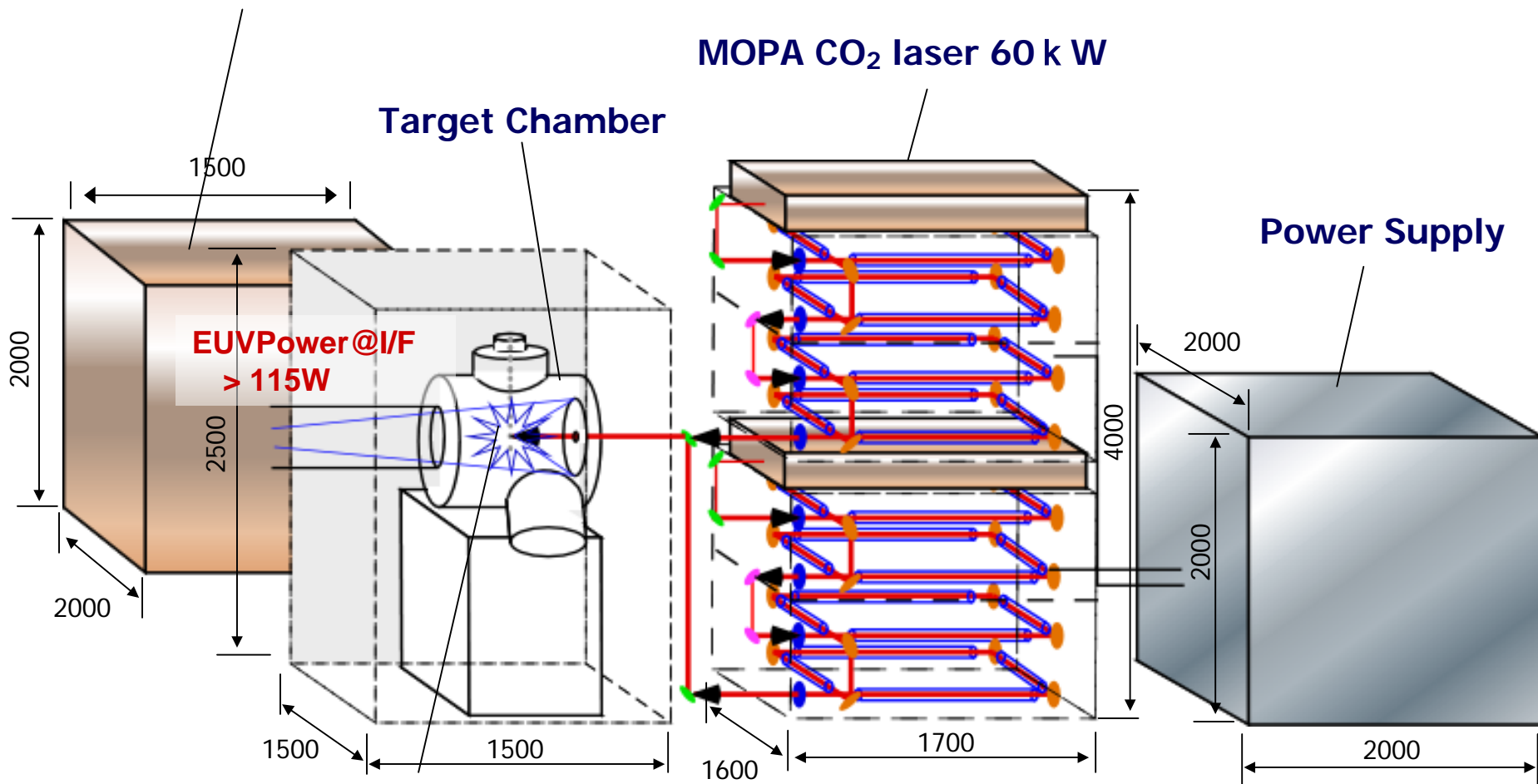

Supplier's Perspective on Cost of Ownership of EUV Sources

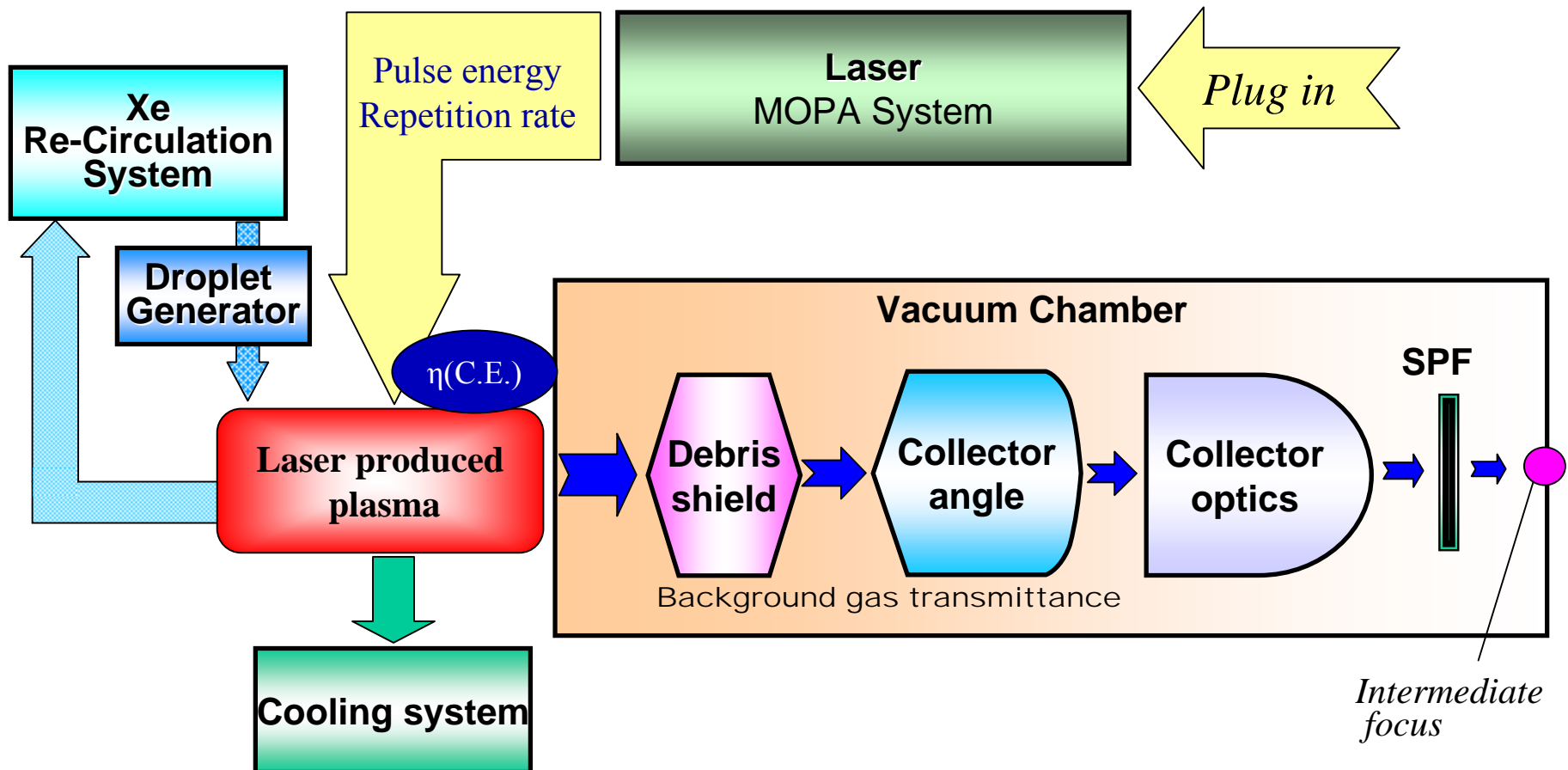
Masaki Yoshioka

Configuration of LPP EUV source

Xenon Re Circulation System (XRS)



Configuration of LPP EUV source



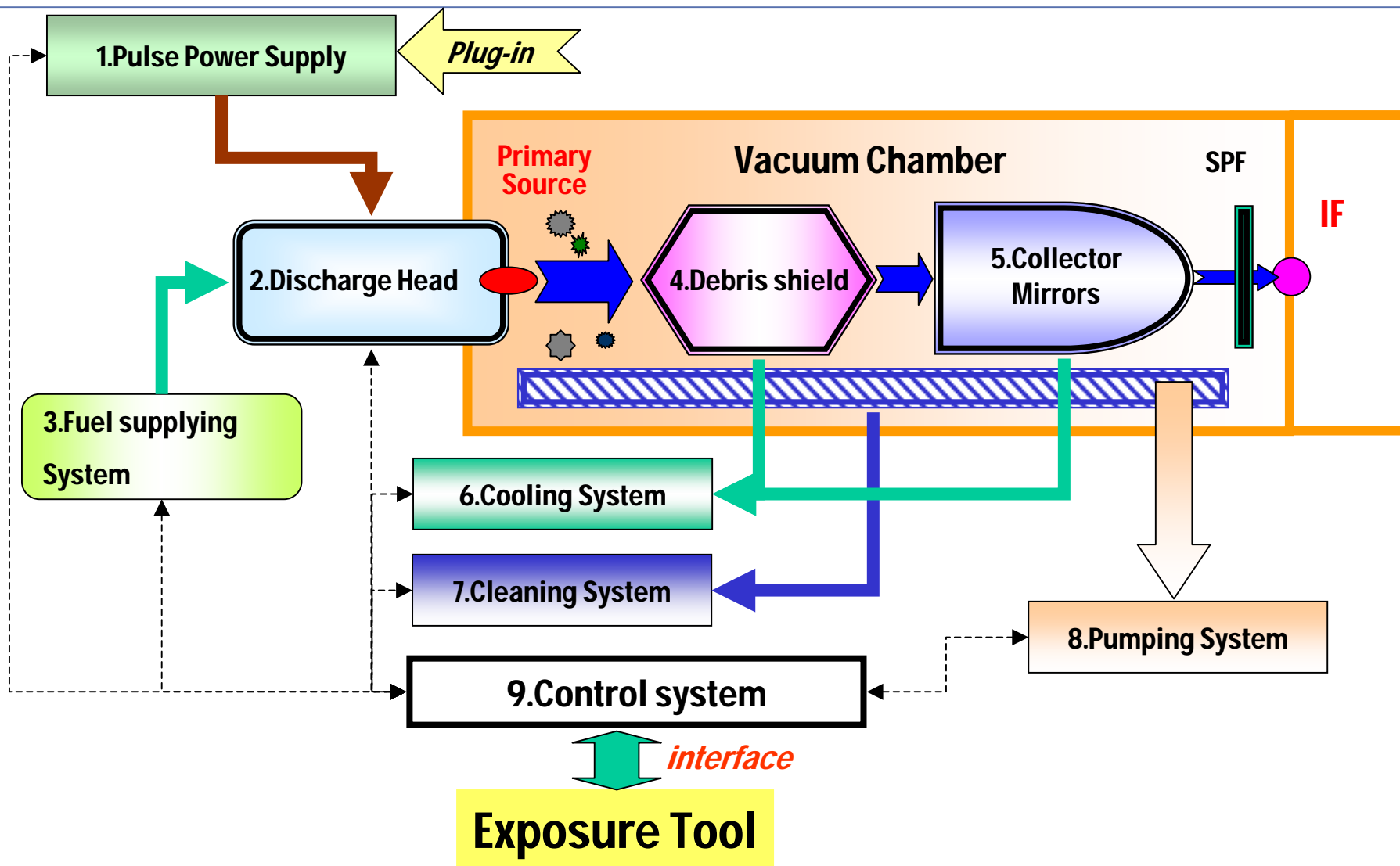
Cost Estimation of LPP EUV Light

	CO ₂ C.E.=1.0 ~ 0.5%		YAG C.E.=1.2 ~ 0.8%		KrF C.E.=1.2 ~ 0.8%	
	Initial Cost (M\$)	Running Cost (M\$/year)	Initial Cost (M\$)	Running Cost (M\$/year)	Initial Cost (M\$)	Running Cost (M\$/year)
Total	5.5 ~ 8.9	0.56 ~ 0.83	20.8 ~ 30.3	2.56 ~ 3.64	17.5 ~ 25.9	1.91 ~ 2.82
Laser System	3.7 ~ 7.1 { 2 ~ 84kW, 100kHz }	0.32 ~ 0.43	19.3 ~ 28.8 { 5~53kW, 10kHz }	2.29 ~ 3.33	16.0 ~ 24.4 { 5~53kW, 8kHz }	1.65 ~ 2.51
EUV Chamber	1.2	0.03	0.9	0.02	0.9	0.02
Xe Re-Circulation System	0.5	0.14	0.5	0.14	0.5	0.14
Collector Mirror	0.2	0.06 ~ 0.22	0.2	0.09 ~ 0.14	0.2	0.09 ~ 0.14

※ Estimation based on:

- 115W Source Power at I.F.
- 100 units produced in 2016.
- 120 wafer/Hr throughput ⇒ 21.3 Billion pulse /year @ 10kHz
⇒ 213 Billion pulse /year @ 100kHz

Configuration of DPP EUV source



Cost Estimation of **DPP** EUV Light Source

■ **Initial Cost** : **3.7 ~ 5.6** Mill.\$,

■ **Running Cost** : **0.29~0.82** Mill.\$/year

Component	Sn (C.E.=2~3%)	
	Initial Cost (M \$)	Running Cost (M \$ /year)
Total	3.7~5.6	0.29~0.82
Discharge Head	0.4	Electrode Parts 0.1 -0.16
Collector Mirrors	0.4~1.0	Mirror 0.1 ~0.5
Debris mitigation System	0.5	Debris Trap 0.03~0.06
MPC Power Source	0.8~1.5	10kHz Power consumption 103kW Water consumption 8m³/h
EUV Chamber	1.0~1.5	
Water Cooling System	0.3~0.4	
Fuel Supplying System	0.3	Fuel: 0.05-0.09

※ Estimation based on:

- 115W Source Power at I.F.

- 100 units produced in 2016.

- 120 wafer/Hr throughput ⇒ 21.3 Billion pulse /year @ 10kHz