

Hyak, the HPC Escalator & You: A New MOU for Utility HPC

UW Hyak Governance Board Meeting

May 25, 2016

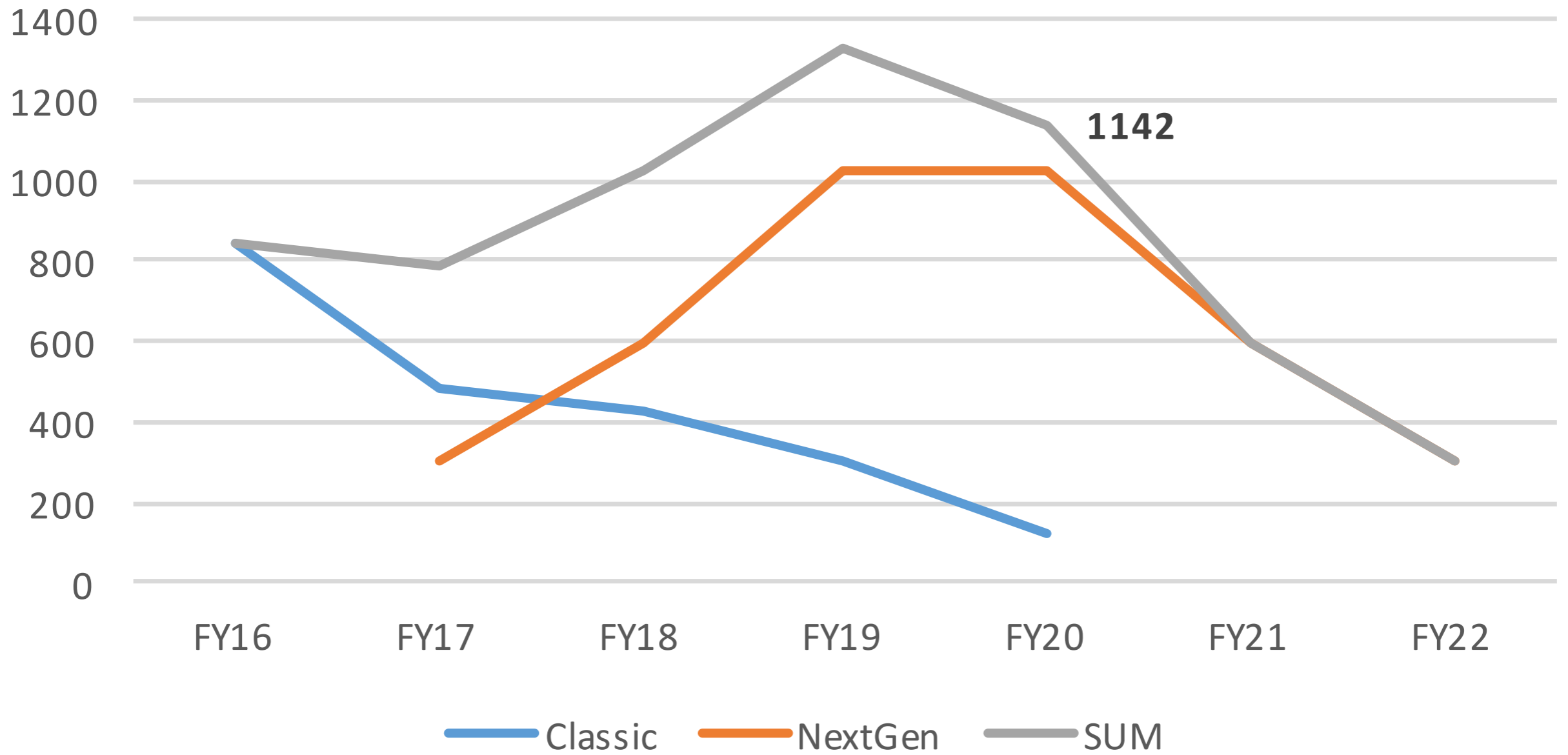
Chance Reschke, UW-IT

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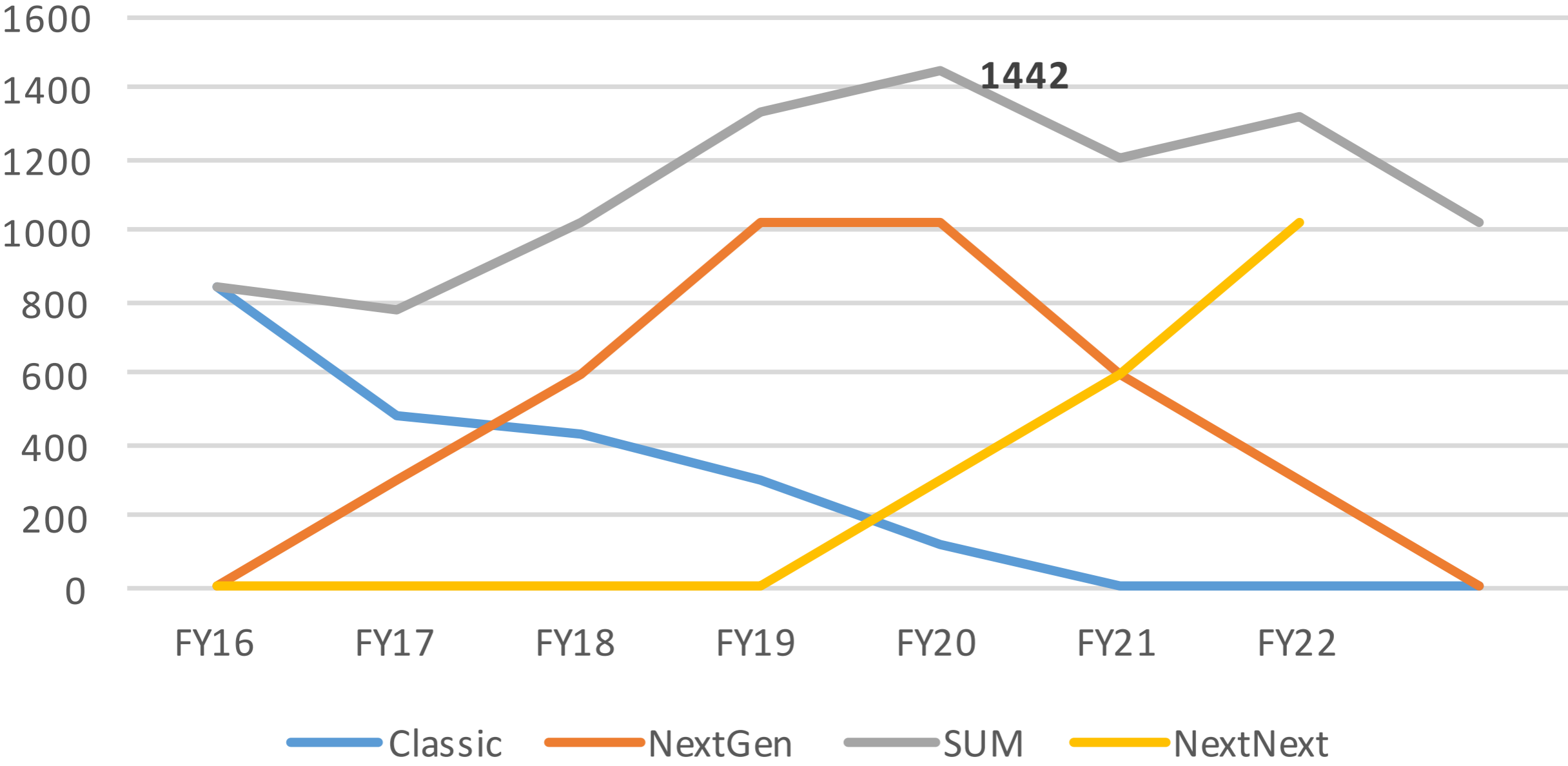
Hyak News

- **NextGen Hyak project approved by UW-IT!**
- **Hyak financial audit results: Great!**
- Supplemental scratch storage online next week
- Globus Online coming to Data Transfer Node

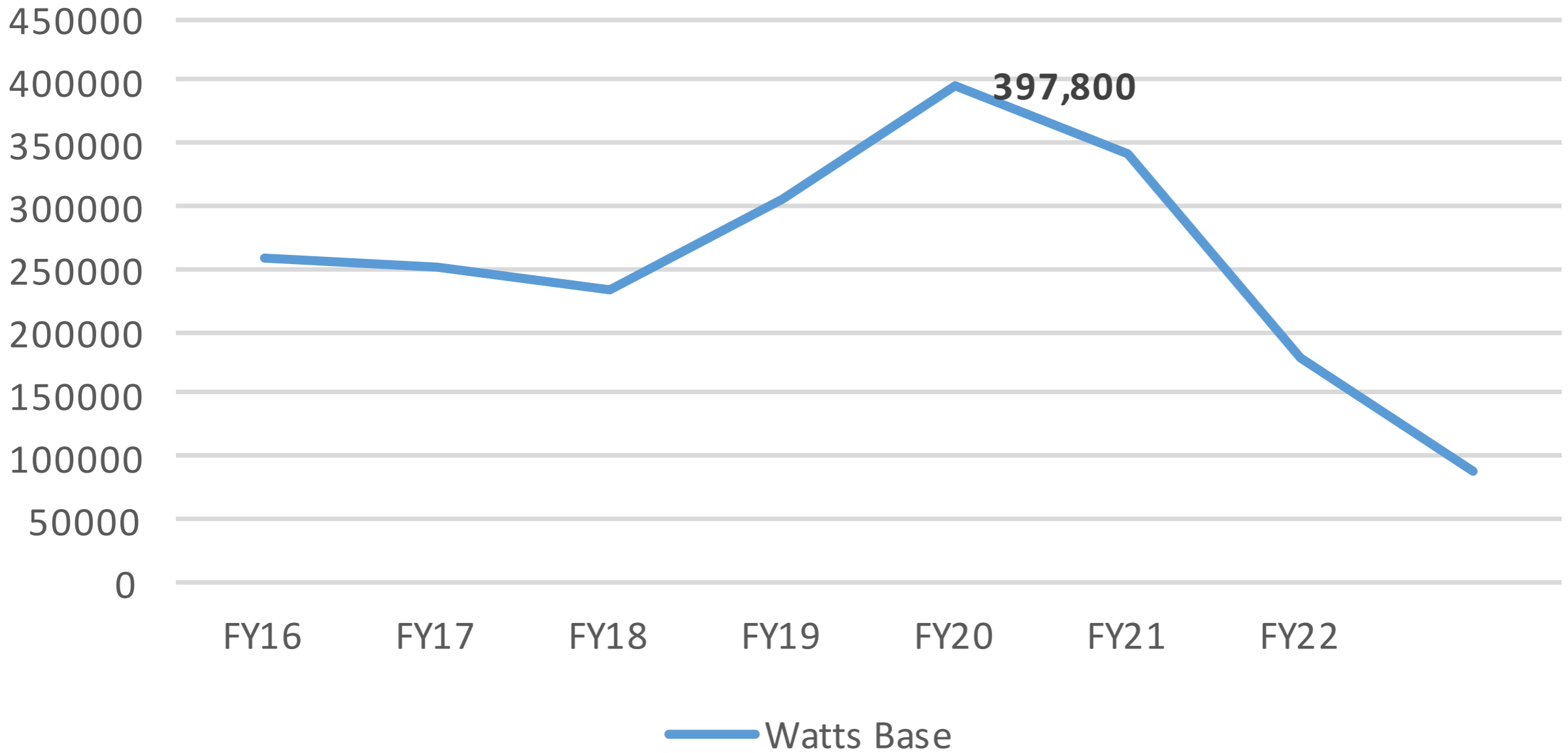
Hyak Node Counts Over Time



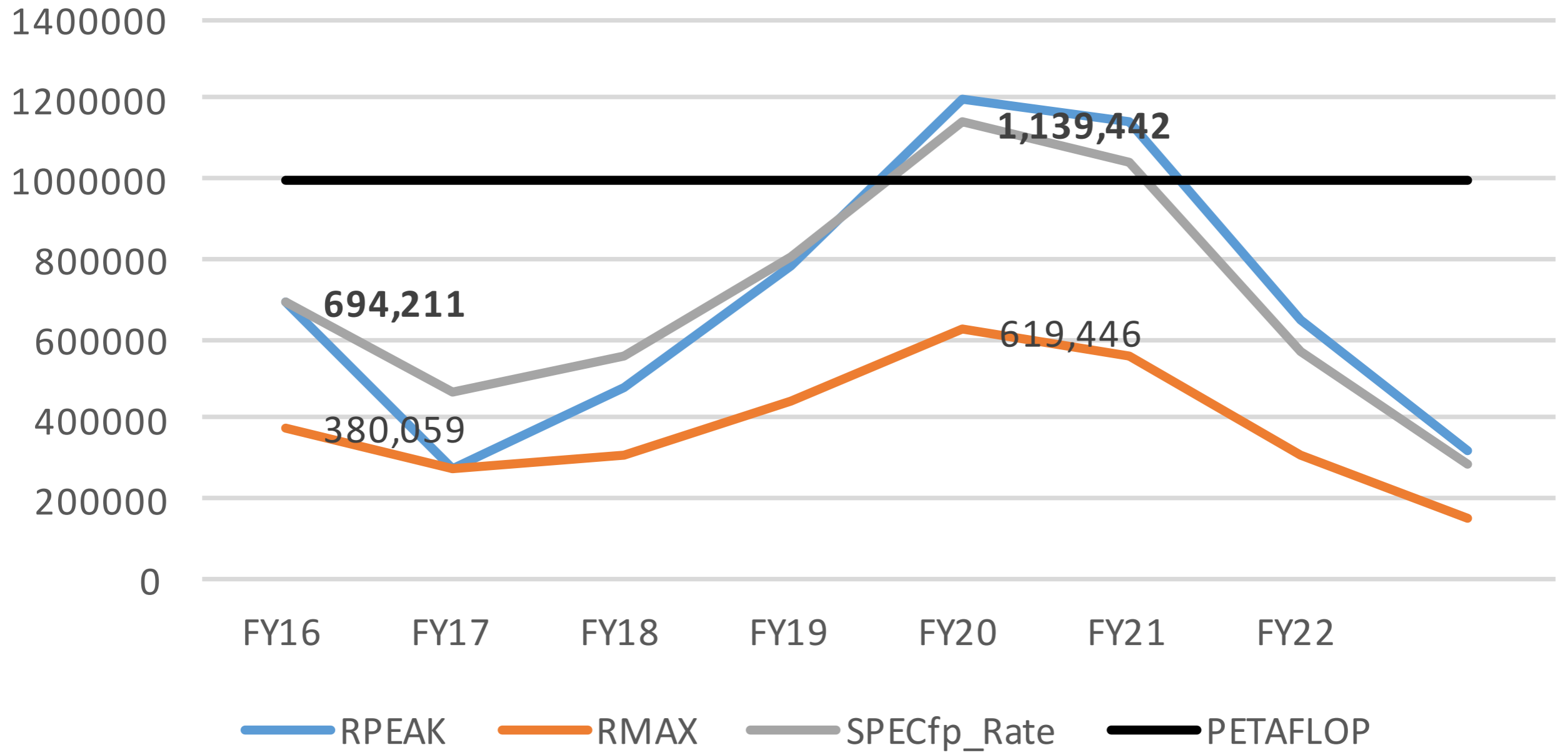
Hyak Node Counts Over Time



Hyak Power Consumption Over Time



Hyak Performance Over Time



RANK	SITE	SYSTEM	CORES	RMAX (TFLOP/S)	RPEAK (TFLOP/S)	POWER (KW)
101	National Astronomical Observatory of Japan Japan	Aterui - Cray XC40, Xeon E5-2690v3 12C 2.6GHz, Aries interconnect Cray Inc.	25,440	801.4	1,058.3	569
102	National Supercomputing Center in Jinan China	Sunway Blue Light - Sunway BlueLight MPP, ShenWei processor SW1600 975.00 MHz, Infiniband QDR National Research Center of Parallel Computer Engineering & Technology	137,200	795.9	1,070.2	1,074

Where we'll be in 2020

RANK	SITE	SYSTEM	CORES	RMAX (TFLOP/S)	RPEAK (TFLOP/S)	POWER (KW)
101	National Astronomical Observatory of Japan Japan	Aterui - Cray XC40, Xeon E5-2690v3 12C 2.6GHz, Aries interconnect Cray Inc.	25,440	801.4	1,058.3	569

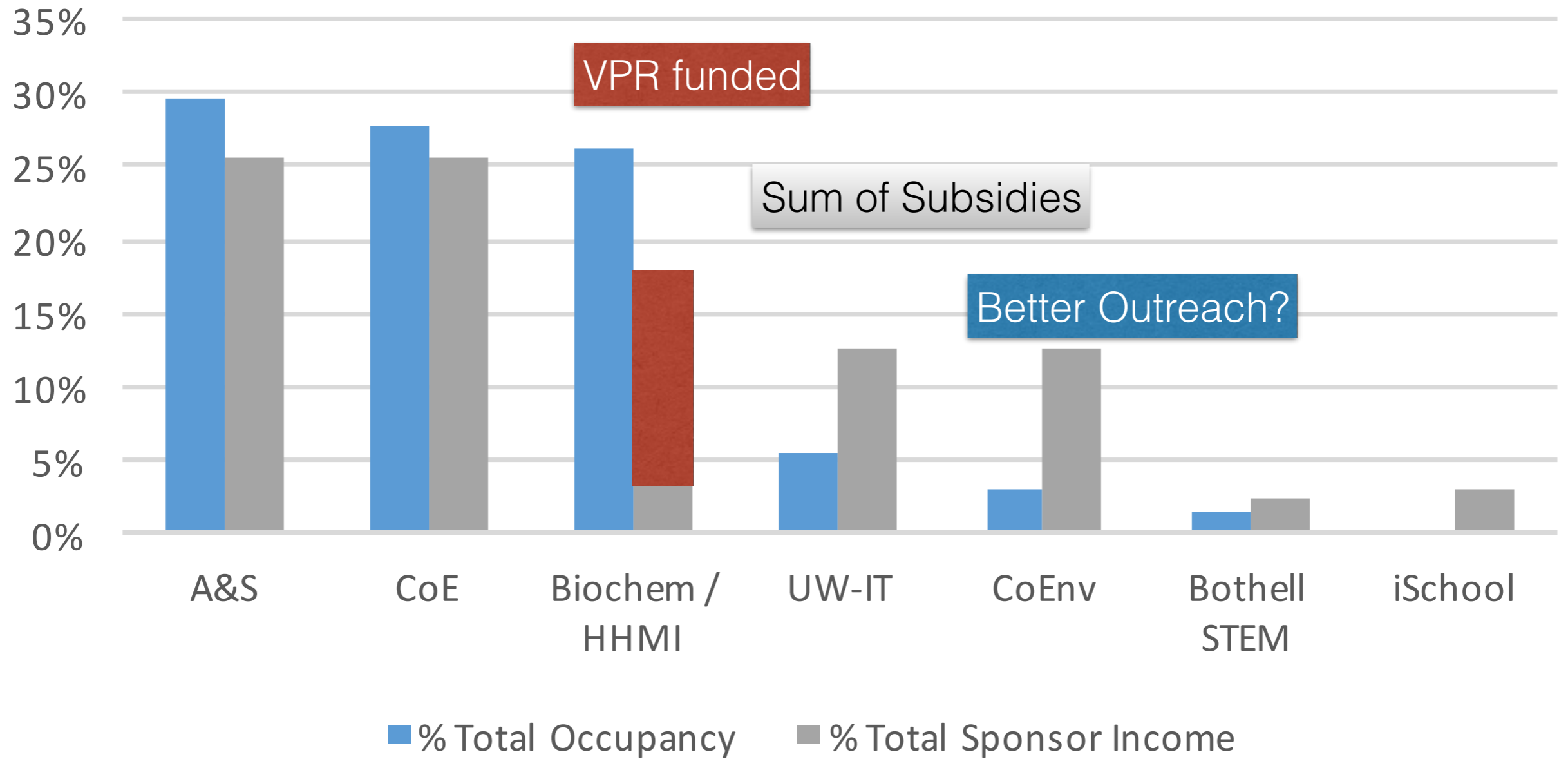
106	National Super Computer Center in Hunan China	Prime - KA Huanan Solution - Xeon Phi 7200, Xeon X5670 6C 2.93 GHz, Proprietary, NVIDIA 2050 NUDT	50,240	771.7	1,042.0	1,100
107	AWE United Kingdom	Spruce B - SGI ICE X, Intel Xeon E5-2680v2 10C 2.8GHz, Infiniband FDR SGI	35,640	767.5	798.3	685
108	Intel United States	Endeavor - Intel Cluster, Intel Xeon E5-2697v2 12C 2.700GHz, Infiniband FDR, Intel Xeon Phi 7110 Intel	51,392	758.9	933.5	387
109	Internet Company China	Lenovo ThinkServer RD650, Intel Xeon E5-2650v3 10C 2GHz, 10G Ethernet Lenovo	70,000	756.9	2,240.0	
110	Internet Company China	Lenovo ThinkServer RD650, Intel Xeon E5-2650v3 10C 2GHz, 10G Ethernet Lenovo	70,000	756.9	2,240.0	
111	Internet Company China	Lenovo ThinkServer RD650, Intel Xeon E5-2650v3 10C 2GHz, 10G Ethernet Lenovo	70,000	756.9	2,240.0	
112	Center for Computational Sciences, University of Tsukuba Japan	COMA (PACS-IX) - Cray CS300 1027GR, Intel Xeon E5-2670v2 10C 2.500GHz, Infiniband FDR, Intel Xeon Phi 7110P Cray Inc.	55,664	746.0	998.5	366

500	Karlsruher Institut für Technologie (KIT) Germany	ForHLR1 - MEGWARE MiriQuid, Intel Xeon E5-2670v2 10C 2.5GHz, Infiniband FDR MEGWARE	10,800	206.3	216.0	205
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Where we are today

115	CAS China	TC1600E, Xeon E5-2680v3 12C 2.5GHz, Infiniband FDR Sugon	137,200	795.9	1,070.2	1,074
116	Internet Service A China	Inspur TS10000 HPC Server, Intel Xeon E5-2650v2 8C 2.6GHz, 10G Ethernet, NVIDIA Tesla K40 Inspur	15,640	730.1	1,085.6	225

Hyak Classic Occupancy vs Investment



	Income Requirements		
	Classic Only	Classic +NextGen	Ongoing
Non-Labor	\$541,359	\$809,109	\$1,076,859
Labor	\$326,930	\$502,878	\$678,826
TOTAL	\$868,289	\$1,311,987	\$1,755,685

FISCAL YEAR	2017	2018	2019	2020
TOTAL INCOME	1,085,000	1,085,000	1,123,000	1,123,000

Sponsorships	887,000	887,000	925,000	925,000
<i>Arts & Sciences</i>	200,000	200,000	200,000	200,000
<i>College of Engineering</i>	200,000	200,000	200,000	200,000
<i>College of the Environment</i>	100,000	100,000	100,000	100,000
UW-IT / STF	200,000	200,000	200,000	200,000
<i>Biochemistry / HHMI</i>	57,000	57,000	100,000	100,000
<i>Bothell</i>	30,000	30,000	25,000	25,000
<i>iSchool</i>	-	-	-	-
<i>Clean Energy Institute</i>	100,000	100,000	100,000	100,000
<i>Office of Research</i>	-	-	-	-
<i>eScience</i>	-	-	-	-

Other Income	198,000	198,000	198,000	198,000
<i>UFIO Tax</i>	-	-	-	-
<i>CoLo Data Center - Provost Support</i>	150,000	94,653	-	-
<i>CoLo Data Center - UW-IT</i>	48,000	103,347	198,000	198,000

UWIT Staff Investment	96,000	96,000	96,000	96,000
<i>Reschke, Chance</i>	48,000	48,000	48,000	48,000
<i>Gupta, Pramod</i>	48,000	48,000	48,000	48,000

Funding Gap if Sponsorship Renewed at ~Existing Levels	
TOTAL Income	\$1,200,000
Gap to Classic Only	\$658,641
Gap to Classic + NextGen	(\$111,987)
Gap to Ongoing	(\$555,685)

FISCAL YEAR	2017	2018	2019	2020
TOTAL INCOME	1,531,000	1,531,000	1,631,500	1,631,500

Sponsorships	1,237,000	1,237,000	1,337,500	1,337,500
<i>Arts & Sciences</i>	300,000	300,000	300,000	300,000
<i>College of Engineering</i>	300,000	300,000	300,000	300,000
<i>College of the Environment</i>	150,000	150,000	150,000	150,000
UW-IT / STF	300,000	300,000	300,000	300,000
<i>Biochemistry / HHMI</i>	57,000	57,000	150,000	150,000
<i>Bothell</i>	30,000	30,000	37,500	37,500
<i>iSchool</i>	-	-	-	-
<i>Clean Energy Institute</i>	100,000	100,000	100,000	100,000
<i>Office of Research</i>	-	-	-	-
<i>eScience</i>	-	-	-	-

Other Income	198,000	198,000	198,000	198,000
<i>UFIO Tax</i>	-	-	-	-
<i>CoLo Data Center - Provost Support</i>	150,000	94,653	-	-
<i>CoLo Data Center - UW-IT</i>	48,000	103,347	198,000	198,000

UWIT Staff Investment	96,000	96,000	96,000	96,000
<i>Reschke, Chance</i>	48,000	48,000	48,000	48,000
<i>Gupta, Pramod</i>	48,000	48,000	48,000	48,000

Funding Gap if Sponsorship Increased 50%	
TOTAL Income	\$1,677,250
Gap to Classic Only	\$1,135,891
Gap to Classic + NextGen	\$365,263
Gap to Ongoing	(\$78,435)

FISCAL YEAR	2017	2018	2019	2020
TOTAL INCOME	1,085,000	1,085,000	1,123,000	1,123,000

Sponsorships	2017	2018	2019	2020
Arts & Sciences	200,000	200,000	200,000	200,000
College of Engineering	200,000	200,000	200,000	200,000
College of the Environment	100,000	100,000	100,000	100,000
UW-IT / STF	200,000	200,000	200,000	200,000
Biochemistry / HHMI	57,000	57,000	100,000	100,000
Bothell	30,000	30,000	25,000	25,000
iSchool	-	-	-	-
Clean Energy Institute	100,000	100,000	100,000	100,000
Office of Research	-	-	-	-
eScience	-	-	-	-

Other Income	2017	2018	2019	2020
UFIO Tax	-	-	-	-
CoLo Data Center - Provost Support	150,000	94,653	-	-
CoLo Data Center - UW-IT	48,000	103,347	198,000	198,000

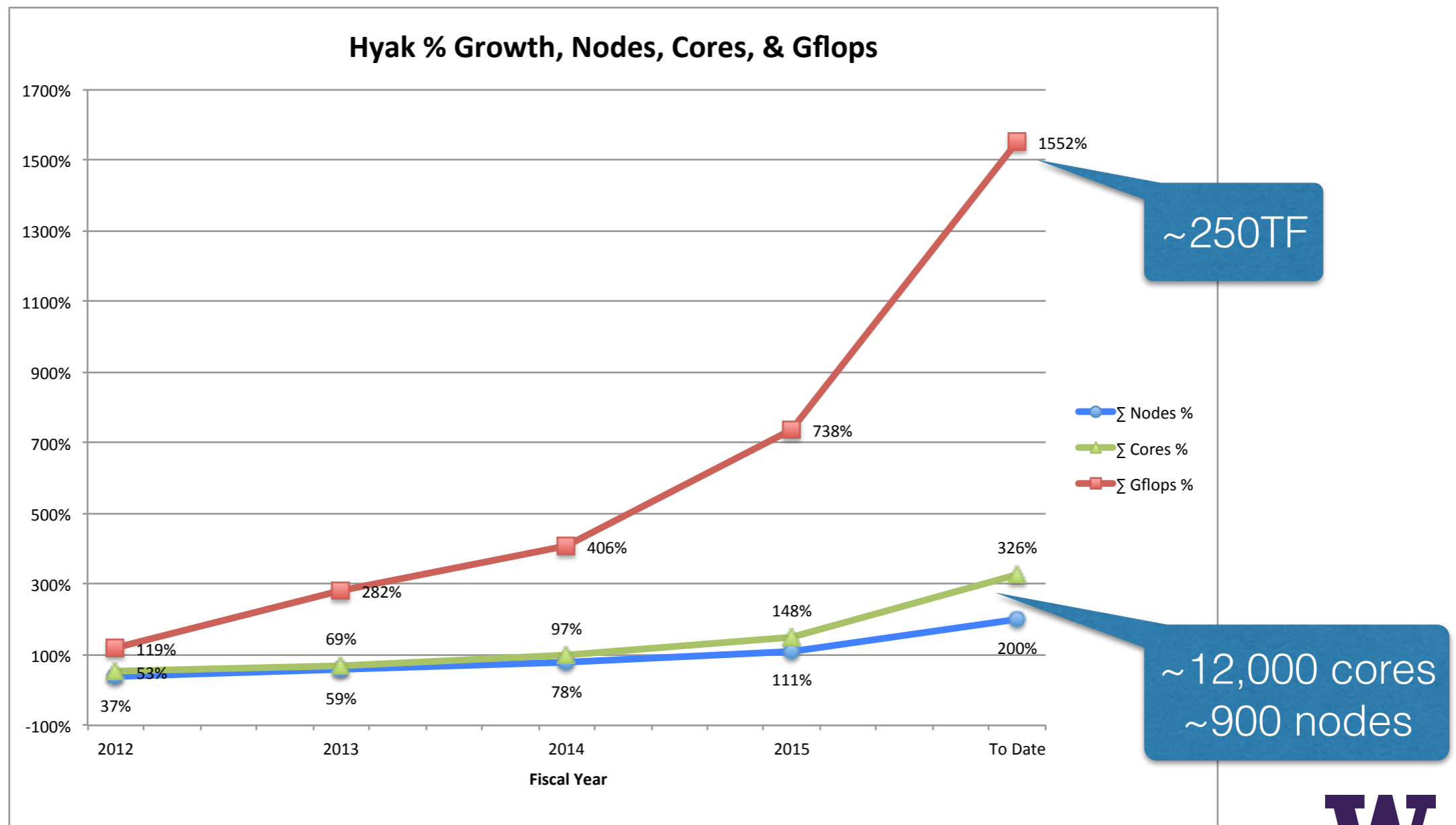
UWIT Staff Investment	2017	2018	2019	2020
Reschke, Chance	48,000	48,000	48,000	48,000
Gupta, Pramod	48,000	48,000	48,000	48,000
+ 2 FTE	300,000	300,000	300,000	300,000

Funding Gap With +2 FTE Subsidy from SOMEWHERE	
TOTAL Income	\$1,500,000
Gap to Classic Only	\$958,641
Gap to Classic + NextGen	\$188,013
Gap to Ongoing	(\$255,685)

The HPC Escalator

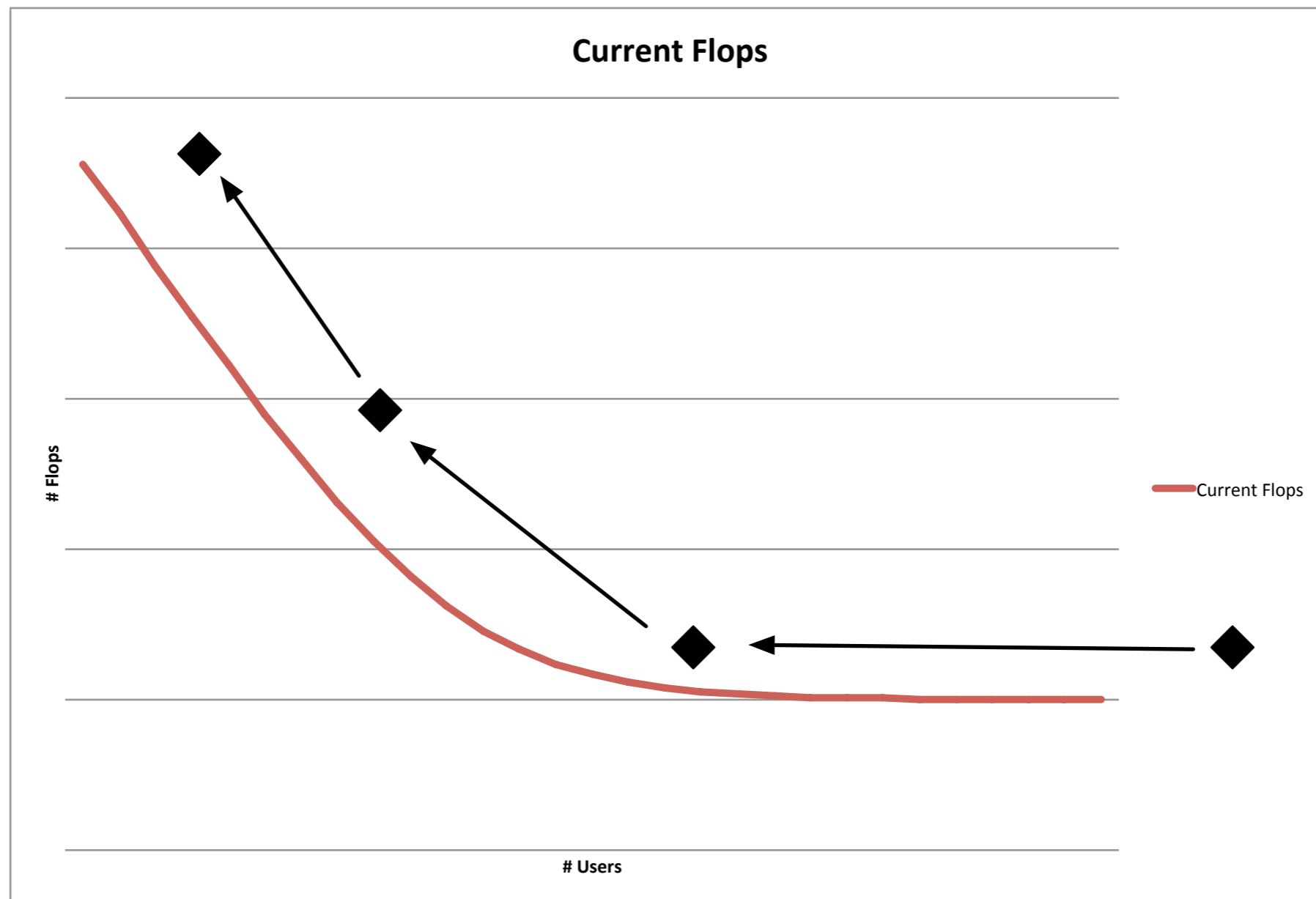
a brief aside

Hyak - A Large & Growing Success



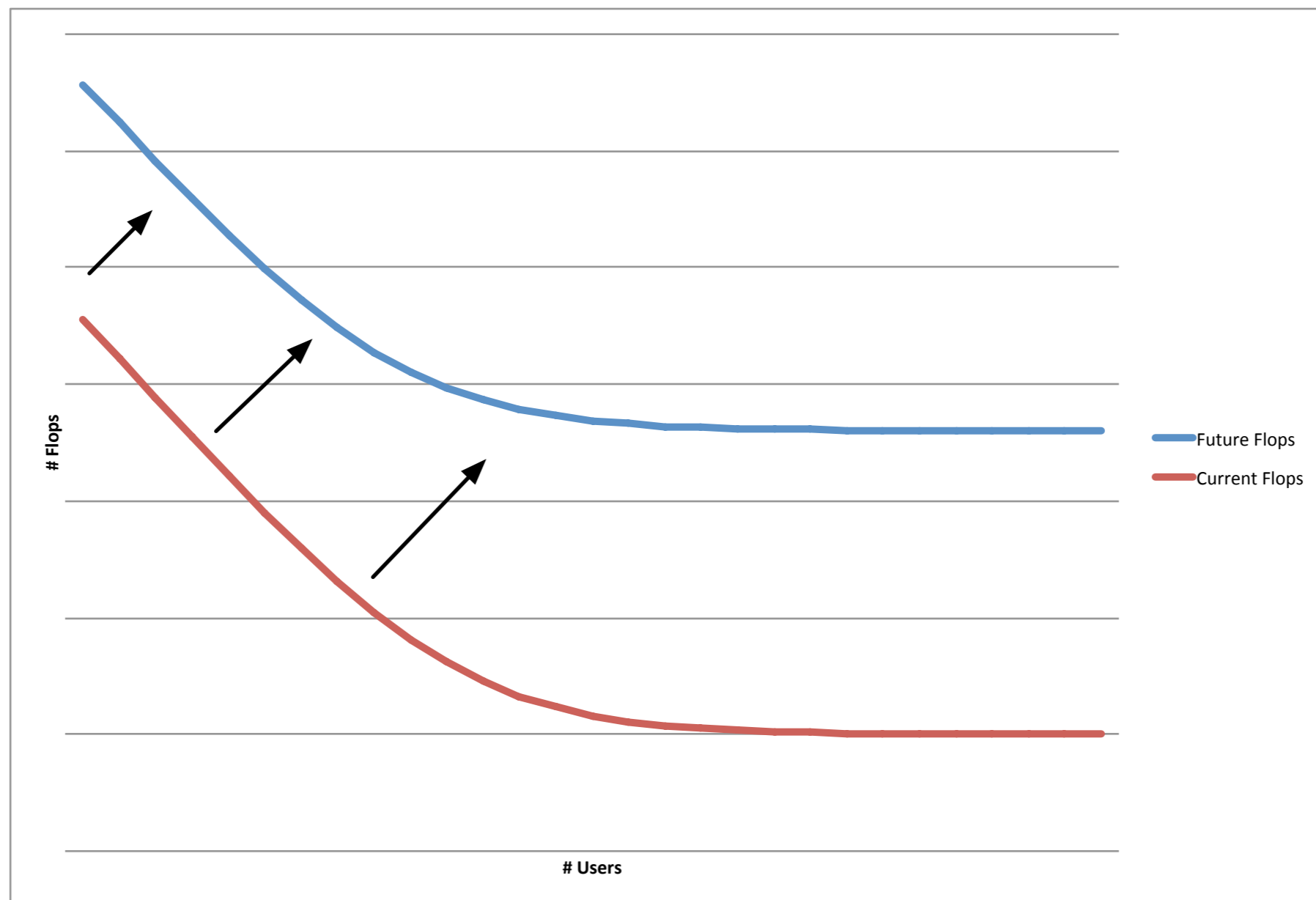
Q: What's Our Mission?

A: The Long Tail Escalator

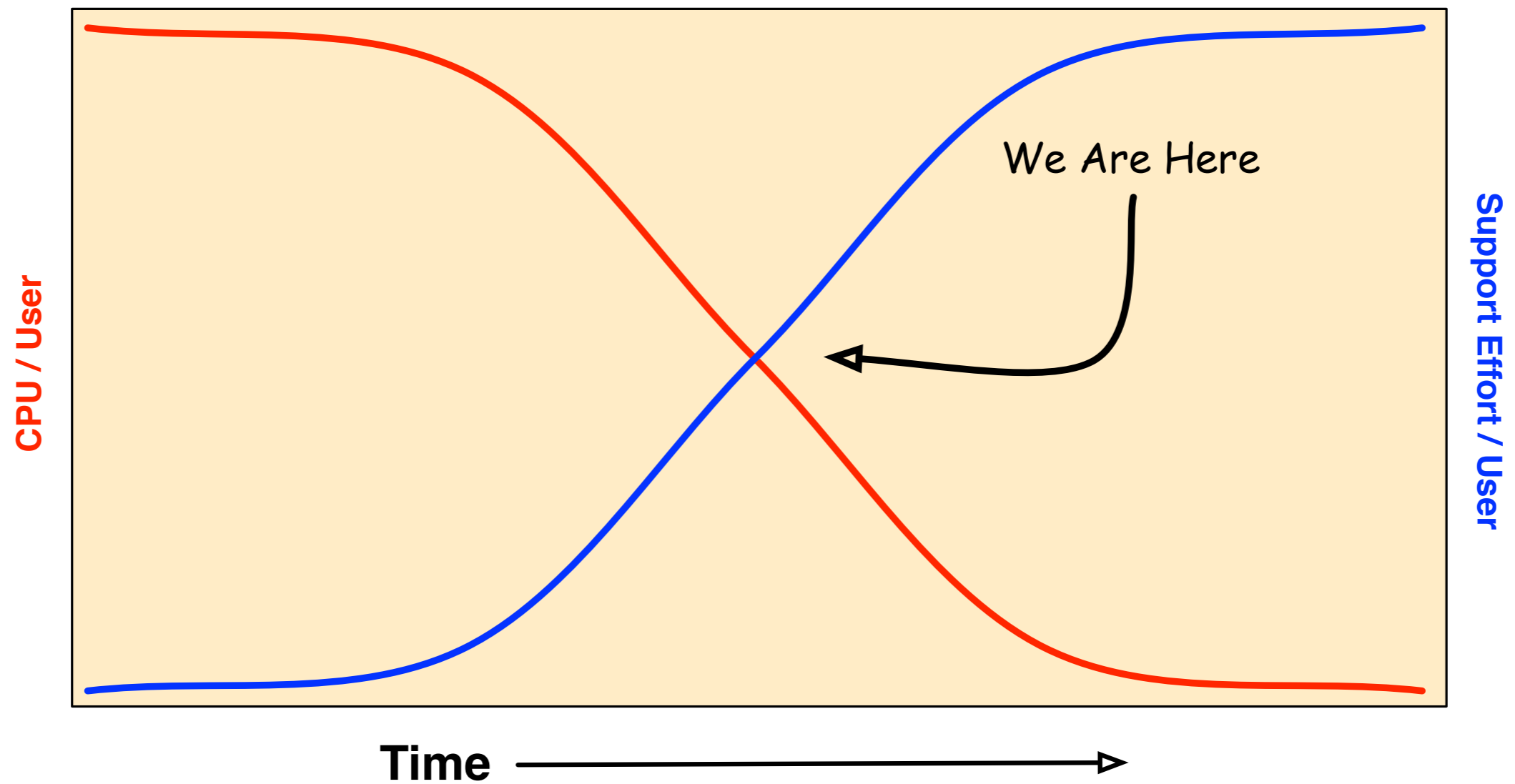


Q: What's Our Mission?

A: The Long Tail Escalator



Q: Where (are we in the mission)?
A: The Long Tail



Action Items

- Staffing
 - Understaffed
 - Departures our largest risk
- Funding
 - Close the Gap!
- Leadership Messaging
 - Is Hyak the campus HPC platform?

Staffing Action Items

- Losing Stephen Fralich Would Be **BAD**
- Heavily **OVERWORKED**
- Expanded Mission — **WITHOUT NEW STAFF**
 - Long Tail / HPC Escalator
 - Heterogeneous Platforms
 - Distributed Computing / Cloud Bursting

Income Action Items

- Close the funding gap!
- Reengage with Office of Research
- Outreach to President, Provost
- Report to Service Strategy Board

Leadership Messaging

- Is Hyak UW's on-site HPC solution?
- If **YES**, then **SAY SO!**
 - Helps with campus outreach (internal partners)
 - Helps when interacting with UW Leadership
 - Helps when interacting with external partners

TOP PRIORITY

- Agree on funding levels
- Agree on MOU language
- **MOU signed by 7/1/2016**
- Sponsor funds transferred on 7/1, as always
- UW-IT free to meet with sponsors