



Challenges for Industry Investment in Accelerator Technologies

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Despite their impact on science, most accelerators that have been built are used for other purposes

- About 30,000 accelerators are in use world wide
 - Sales of accelerators > \$ 2 B /yr and growing
 - Accelerators touch over \$ 500B/yr in products
 - Major Impact on our economy, health, and well being



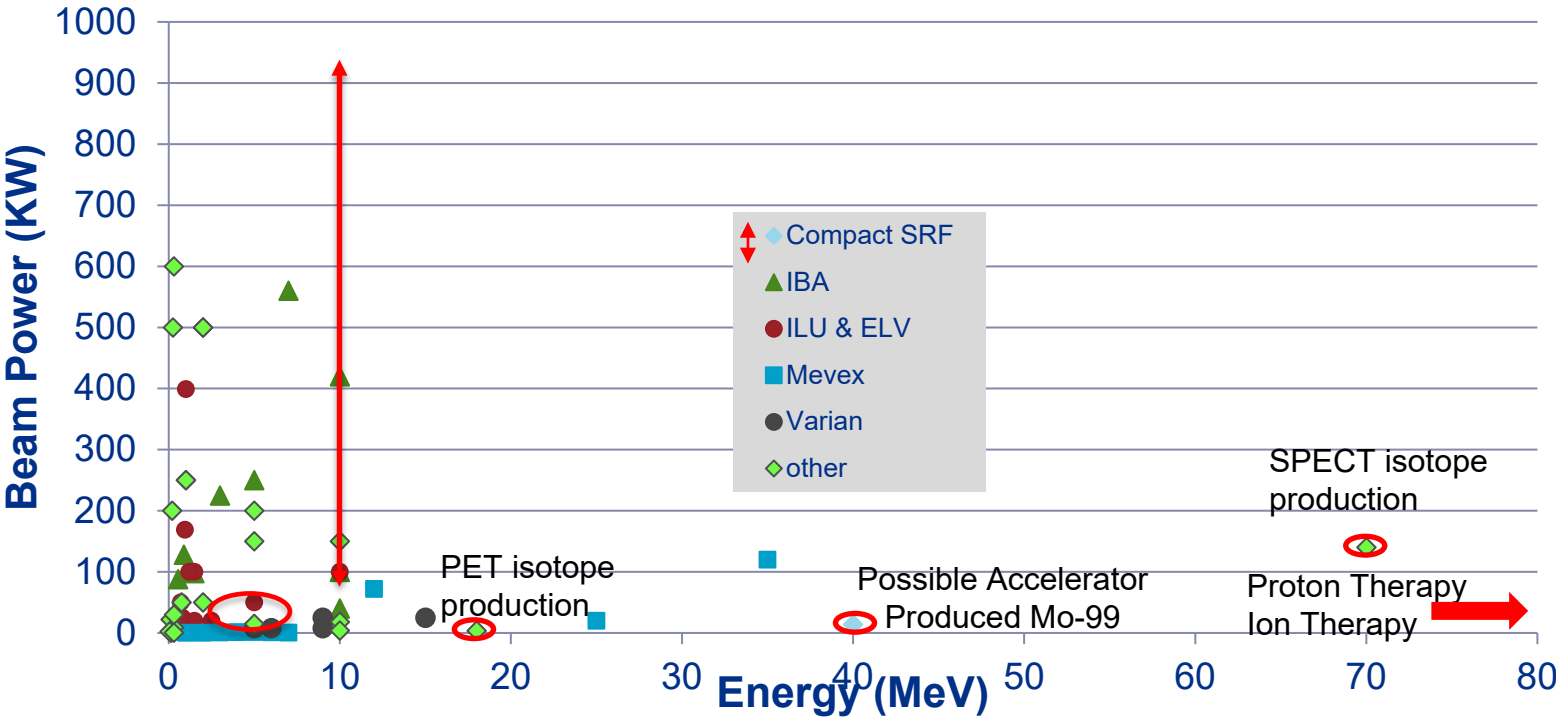
Aside from Radiation Therapy, these examples are low energy, <1 MeV



Digital Electronics



High Energy (>1 MeV) Industrial Accelerators in Production today

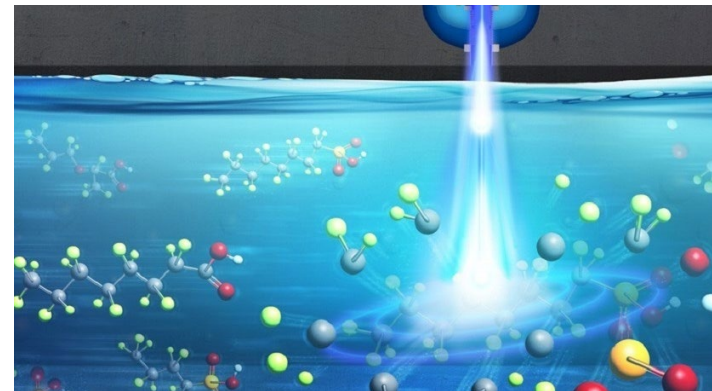


Future Applications – High Power (SRF) & Low Power (probably conventional)

Accelerators are established technology – but also new and unknown

In particular, high-power accelerators open new, unfamiliar applications

- Medical Device Sterilization (entry level)
- Environmental remediation (big potential market)
- Sewage and water treatment
 - Municipal systems (conservative in \$\$ and technology)
- Industrial Chemical processing?



High-power accelerator applications are new and unknown

Development is expensive

- Lead times are long
 - Return on investment greater than 3 years (10 ?)
 - Longer than what traditional investors are looking for
 - Too much customization
 - Needs to be more modular with standard components
- # of units low?
 - Possible exception is environmental remediation

APV - VC Perspective

APV Analysis (9.4% discount)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
EBIT	(1,450)	(167)	3,115	6,738	8,739	9,929	10,473
Tax @ 35.0%	-	-	565	2,543	3,298	3,747	3,953
+ Depreciation	127	320	600	940	1,247	1,243	1,095
- Capital Expenses	(1,000)	(1,200)	(1,600)	(1,800)	(1,273)	(687)	(227)
- Increase in Working Capital	(1,997)	(1,616)	535	(3,640)	1,159	(1,005)	(332)
FCF	(4,320)	(2,663)	2,085	(305)	6,575	5,733	7,057
TVE @ 3.0%							112,825
Total FCF	(4,320)	(2,663)	2,085	(305)	6,575	5,733	119,882
Discount Factor @ 9.4%	0.914	0.835	0.763	0.697	0.637	0.582	0.532
PV of FCF	-	-	1,590	-	4,187	3,336	63,745
Sum of FCF	72,859						
(-)Debt	-						
Post-Money Investment	72,859	90.4% Entrep. Ownership					
Pre-Money	6,983	=\$4,320 + \$2,663 + \$0,000 + \$0,305					
	65,877						

- What is the business model that will attract investors and manufacturers?