

The Startup Ecosystem



Adam de Sola Pool

April 14th 2016

Harvard Energy Journal Club

Warning!

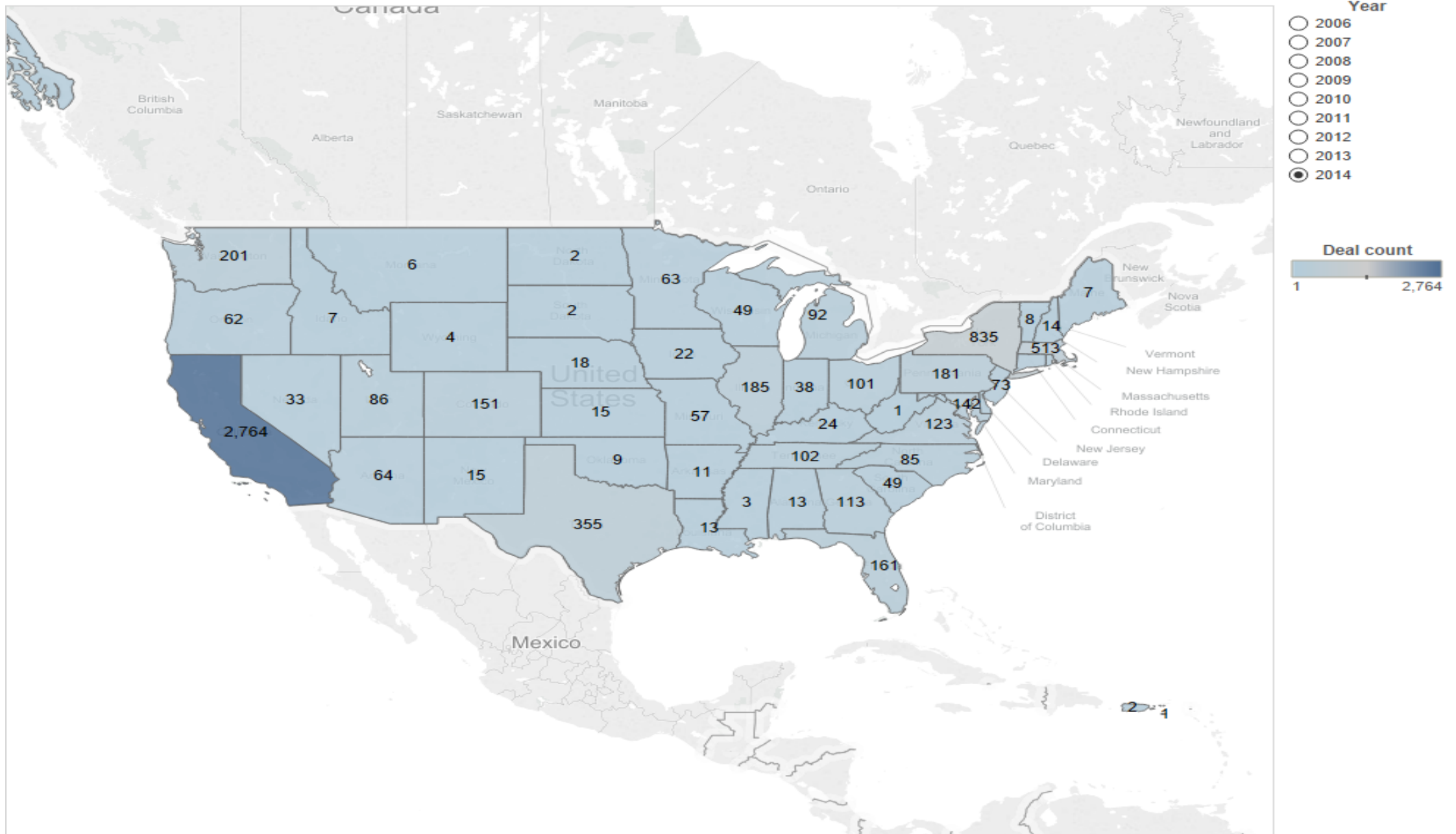
- *All generalizations soon to be made can be proved “wrong” due to exceptional cases*
 - Startup data has a very broad distribution
 - Large “tails” at both ends of the spectrum (winners and losers)
 - Huge survivorship bias
 - Press reports focus on the exceptional cases not the average or normal ones

The Bad News First Statistically You Will Fail

- Angel Capital Foundation says “It is extremely important to identify the risks of a venture because even in optimal conditions, many elements are required for success. Take the following scenario:
 - Management is capable and motivated 90%
 - Market demand is as expected 90%
 - Production is scaled up as planned 90%
 - Competition is held at bay and IP is defendable 90%
 - Liability and litigation is avoided 90%
 - Company has sufficient capital 90%
 - Existing customers are able and willing to pay 90%

= Success Probability 48%
- In the event that even one of these risks is not assessed correctly, and the chance of success is actually 50 percent, the overall probability success is reduced to 27 percent.”
- So maybe that job in a big slow moving bureaucratic company looks a bit better?

Venture Deal Count by State



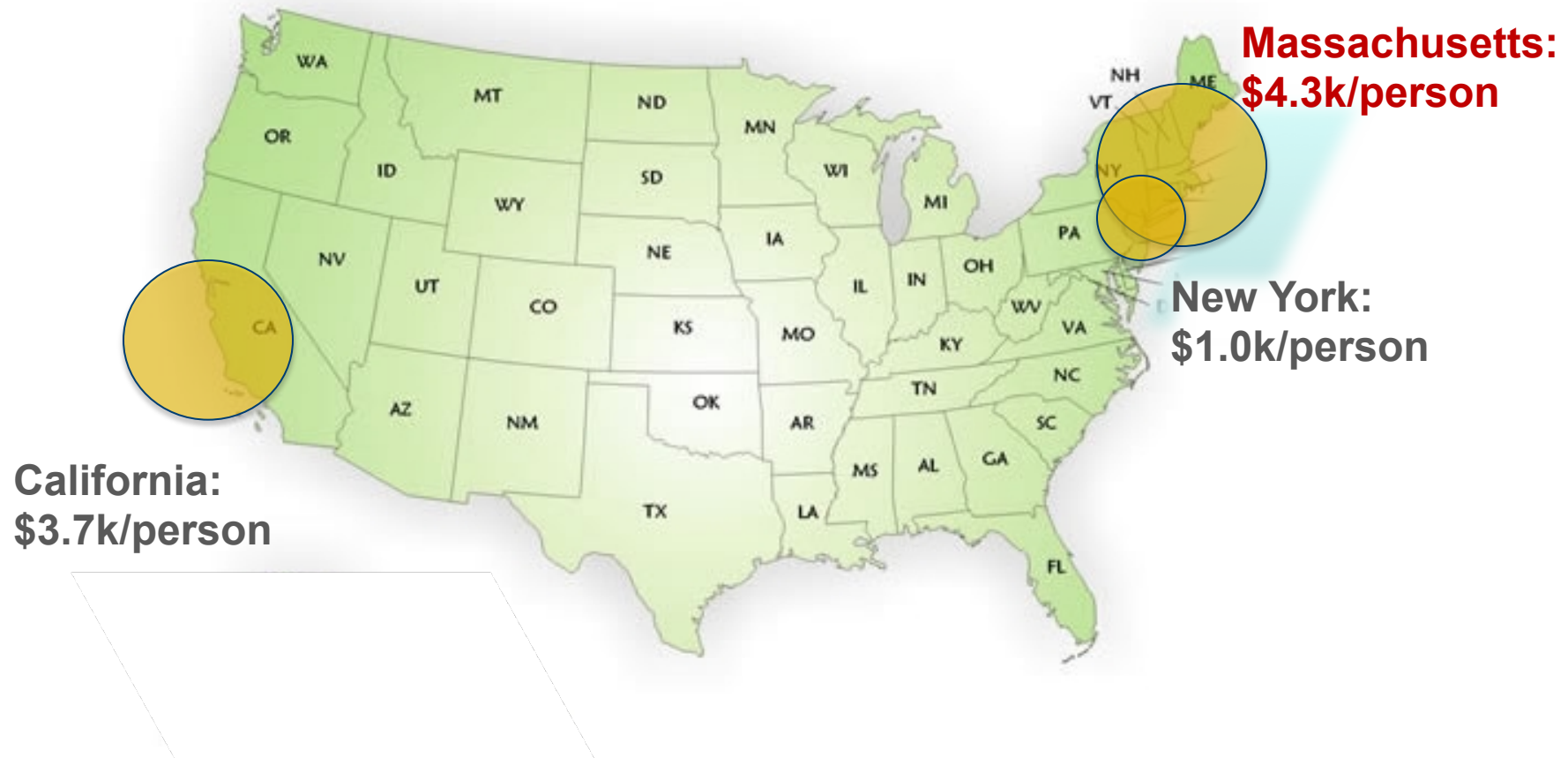
VC Capital Under Management - 2014



80% of total VC \$ in these 3 regions

Source: NVCA 2015 Yearbook

VC Capital Under Management Per Capita - 2014



Source: NVCA 2015 Yearbook, US Census, CA is counted as four MSAs (LA, SF, San Jose, San Diego)

Boston is **second only to Silicon Valley** in Ecosystem Value with \$46 billion and ranked #5 in Startup Output with **3,700 to 4,500 active tech startups**.

Quotations From
The Global Startup Ecosystem
Ranking 2015
By: Compass.co

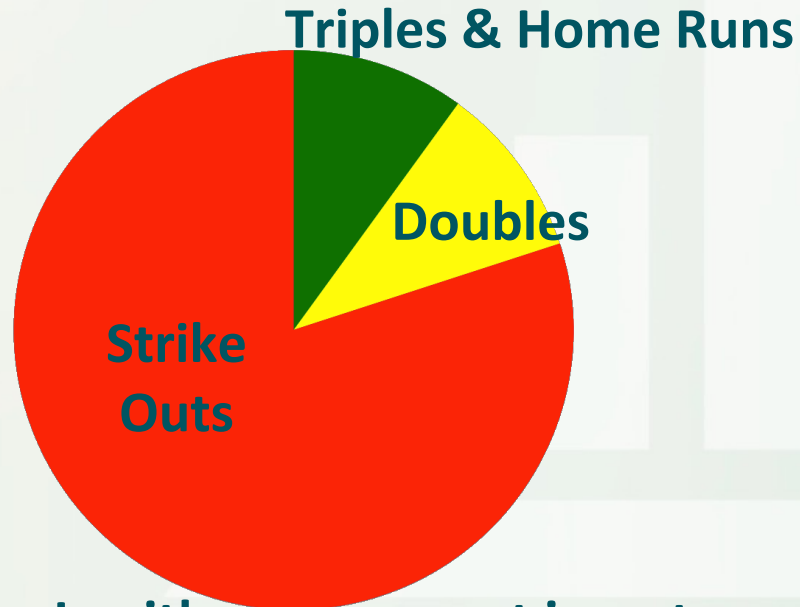
Boston's startup ecosystem is a **worldwide leader in science and technology-based enterprises in areas like pharma, life sciences, biotech, and robotics**. Entrepreneurs in Boston generally benefit from a **rich network of mentors** and supportive organizations such as Bolt, Techstars Boston, Harvard Innovation Lab, and MassChallenge—the latter claiming to be the largest startup accelerator in the world.

Boston ranks **third in Funding** with \$4.4 billion in VC investments.

Portfolio Models

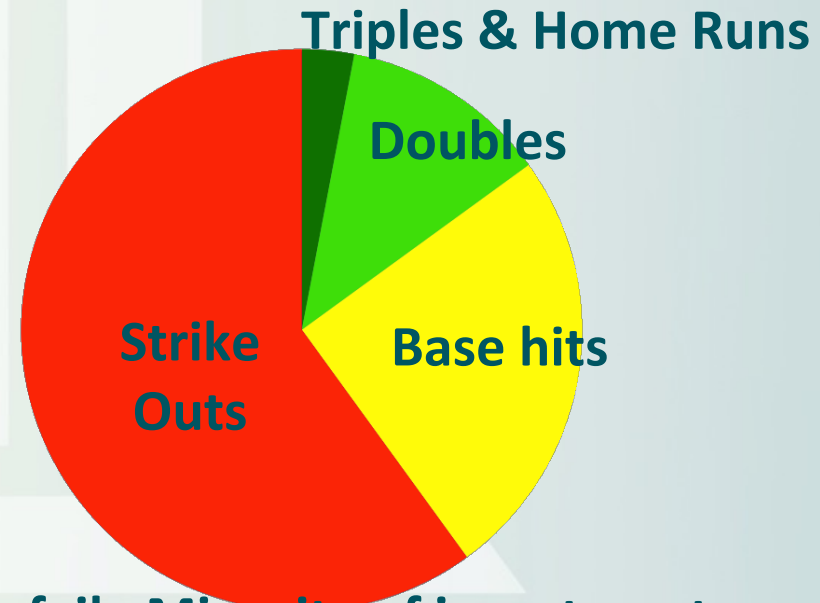
VC Model:

Go Big or Go Home



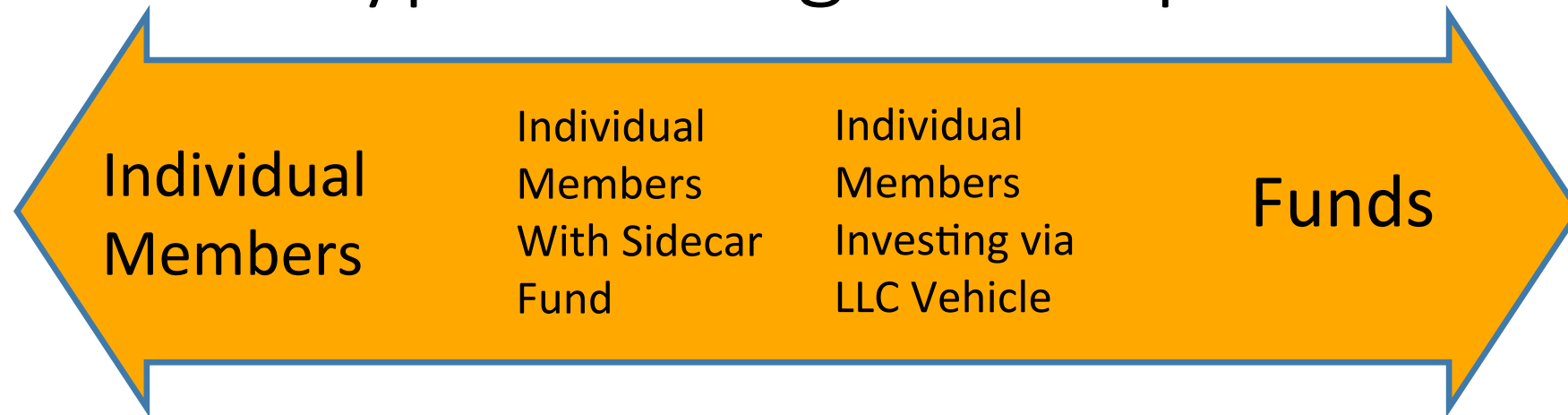
Angel Model:

Base Hits and Runs



In either case, most investments fail. Minority of investments provides majority of return. Unlike VCs, Angels try to preserve capital and get on base by being careful about capital intensive all-or-nothing bets.

Types of Angel Groups



- Launchpad Venture Group
- Walnut Venture Associates
- Boston Harbor Angels

- Common Angels
- Golden Seeds
- Tech Coast Angels

- Beacon Angels
- Virginia Active Angels

- Hub Angels

List of all angel groups in US, by Geography: <http://www.angelcapitalassociation.org/directory/>

Angels Fund Majority of Startups in USA

Angels Provide ~90% of Outside Equity for Startups

Angel Investors (2013)

- \$24.8 billion
- **71,000 deals**
- 32,000 seed
- 29,000 early stage
- 9,200 expansion
- > 298,000 individuals

Venture Capital (2013)

- \$29.6 billion
- **4,050 deals**
- 120 seed
- 1,375 early stage
- 2,550 later/expansion
- 548 active firms

Funding Statistics

Source (Halo Report and Angel capital Association)

Boston Area (13% of deals in total USA)

- \$0.6 mm = median size of Angel funding round from 2010 – 2015 (2015 = \$1 mm)
- Add in VC's and median size jumps to \$1.5 mm (2015 = \$2.9 mm)

Seed Round 2014 Pre-Money Valuations
by Quartile



■ 5 to 10 mm

■ 4 to 5 mm

■ 2.5 to 4 mm

■ 0.3 to 2.5 mm

Most active angel groups
in Boston Area:
Launchpad is #1
Cherrystone Angels in RI
Maine Angels

Median 2010 – 2015 = \$3 mm

Many Accelerators / Incubators

- Greentown Labs (energy & Cleantech)
- MassChallenge (Largest in world)
- BOLT (hardware)
- TechStars
- Artists Asylum (art)
- CIC
- MIT VMS + others



Clean energy companies that have recently received >\$10M in financing (Source: Crunchbase)

Company	Key Sector	Date of Last Round	Amount Raised
Enbala Power Networks	Smart Grid	Sep-15	\$29,580,000
Cool Planet Energy Systems	Renewable Energy	Sep-15	\$146,770,000
Solexel	Solar PV	Aug-15	\$223,920,000
Itineris	Smart Grid	May-15	\$20,900,000
Joule Unlimited	Renewable Energy	May-15	\$190,000,000
Eos Energy Storage	Energy Storage	May-15	\$401,000,000
Sentient Energy	Smart Grid	Apr-15	\$22,500,000
Stem	Energy Efficiency	Apr-15	\$67,100,000
Next Step Living	Energy Efficiency	Apr-15	\$87,800,000
Solar Universe	Solar PV	Apr-15	\$11,000,000
OutSmart Power Systems	Energy Efficiency	Apr-15	\$10,700,000
Solantra Semiconductor	Solar PV	Apr-15	\$33,800,000
ViZn Energy Systems	Energy Storage	Apr-15	\$15,440,000
GreenRoad Technologies	Automotive/Energy Efficiency	Mar-15	\$98,900,000
Boston Power	Energy Storage	Feb-15	\$370,600,000
Solaria	Solar PV	Feb-15	\$116,200,000
Bloom Energy	Renewable Energy	Jan-15	\$1,100,000,000

Clean Energy Venture Group

- 11+ investments for \$1.3+ mm with approx. 30% IRR (mostly unrealized)



Key Items in a Startup

- Path to revenue
- Solving a commercial problem
 - Oxygen, Aspirin, Jewelry
- Team
- Short term funding
 - SBIR / DOE etc.
- Talk to Customers
- Prepare to pivot
- Prepare to change / be fired
- Founders Agreement
- IP protection
- Mentors
- Opinion leaders near you
- Location, location, location!
- Commercial skills not just scientific skills
- 6 pitch books (2 / 10 / 30 Pages)
 - Problem, Market size, Your solution, IP
 - Team, Financial Projections, \$ Needed, Exit

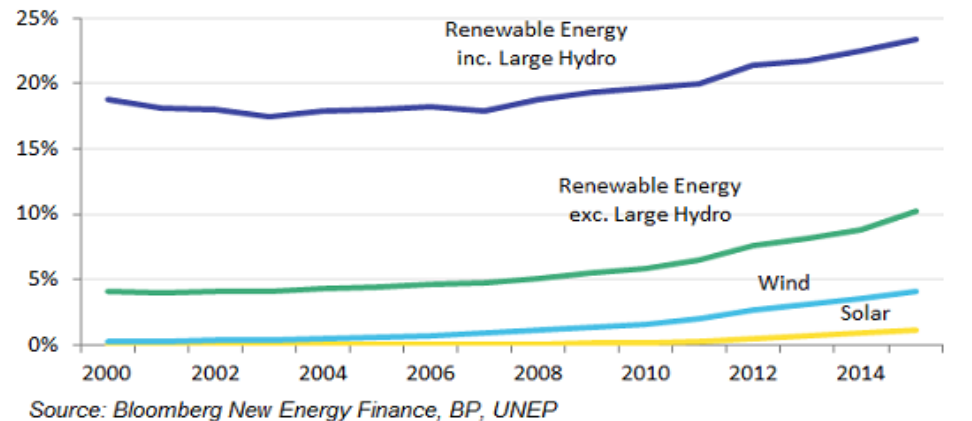
Energy Startups

- Infrastructure

- Capital Intensive
- More Secure?
 - Geographic Monopoly
- Shorter Time Frames?
- Policy Dependent
- Local “Culture”

- Technology

- Technology Intensive
 - So check your IP worldwide
- Less Secure?
- Long Lead Times to Adoption
- Possible to be a “Unicorn”
- More Fun?
- SBIR / DOE (policy) Dependent



Development

- 2 – 10x returns
- 50% + failure rate
- 0.5 to 3+ years time
- Ramped cash outflows
- Capital light (less than \$100 K / MW)
- Sales price circa \$100 to 200 K / MW

Construction

- 20+% IRR's
- Less than 10% failure rate
- 1 year +
- Capital intensive (usually \$10's to \$100's of millions)
- Lumpy cash outflows weighted to beginning

Operation

- 8-14% IRRs
- Rarely fails except for weather (insurance)
- 15 + year cash flows
- Cash outflows mostly at time of acquisition (and major overhauls)

Useful Links

- How to Create your Business Plan
- Bill Aulet's 24 steps
 - <http://disciplinedentrepreneurship.com/>
- Business Model Canvass
 - <http://www.businessmodelgeneration.com/canvas/bmc>
 - Legal fees are not a barrier: online sources + “deals” from big firms
- For Presentation Techniques
 - Chuck Goldstone
 - <http://newventureinstitute.org/about.html>
 - Linda Plano
 - <https://www.planoandsimple.com/about-linda/>

More links for more information

- www.angelcapitalassociation.org
- <http://techscene.at/boston>
- <http://bostontechguide.com/>
- <http://bostonvcblog.typepad.com/vc/2015/09/what-makes-the-boston-startup-scene-special.html>
- <https://www.f6s.com/techstarsapp>
- <http://masschallenge.org/accelerator/model>
- <http://masstech.org/innovation-ecosystem/innovation-economy-resources/incubators-and-accelerators-0>
- <http://blog.startupcompass.co/the-2015-global-startup-ecosystem-ranking-is-live>
- <http://www.maps-inc.org/our-community/portuguese-speaking-community-in-massachusetts/>

Thank you

- Adam de Sola Pool
- Telephone + 1 617 547 5717 or + 1 646 785 4946
- pool@eip.com.pl
- Skype name is adampool
- 105 Irving Street, Cambridge MA 02138 USA