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**Elle Carberry**  
**Greentech Capital Advisors**

*The Future of Renewable Energy Jobs Market*

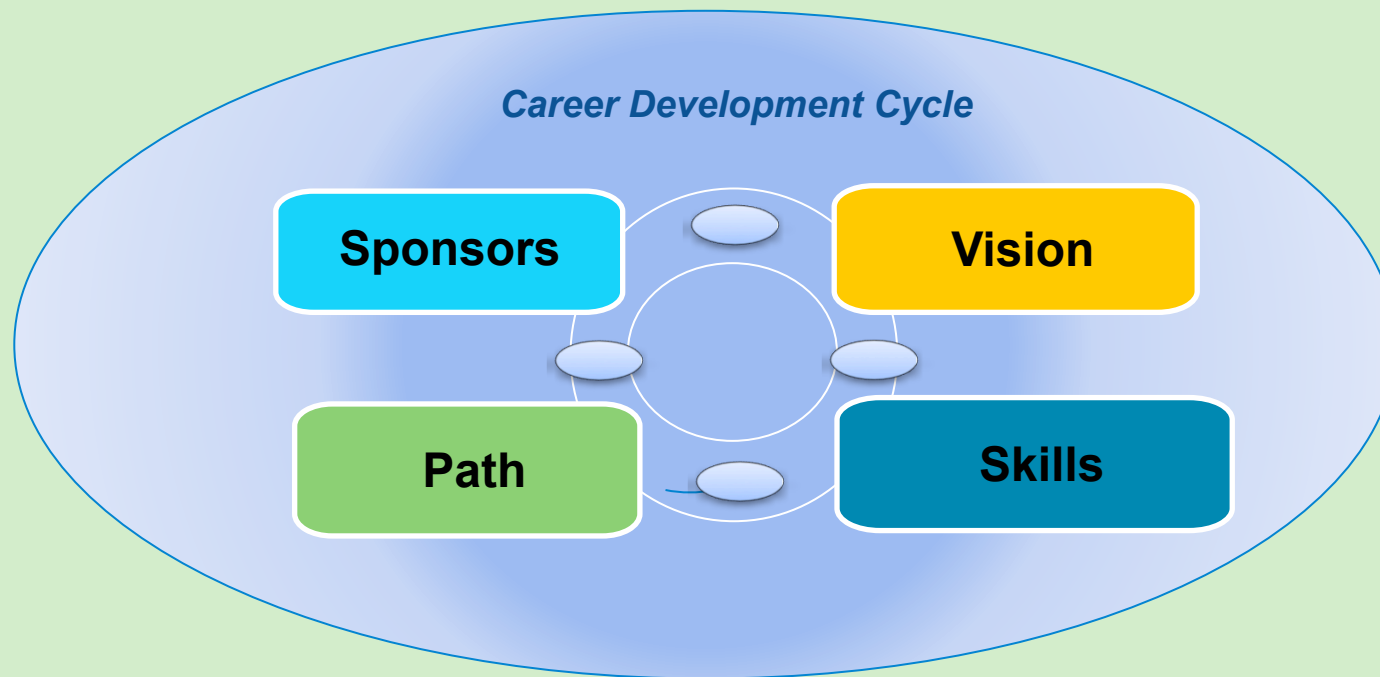
**Columbia University SIPA, Center on Global  
Energy Policy, Women in Energy Program**

**February 23, 2017**

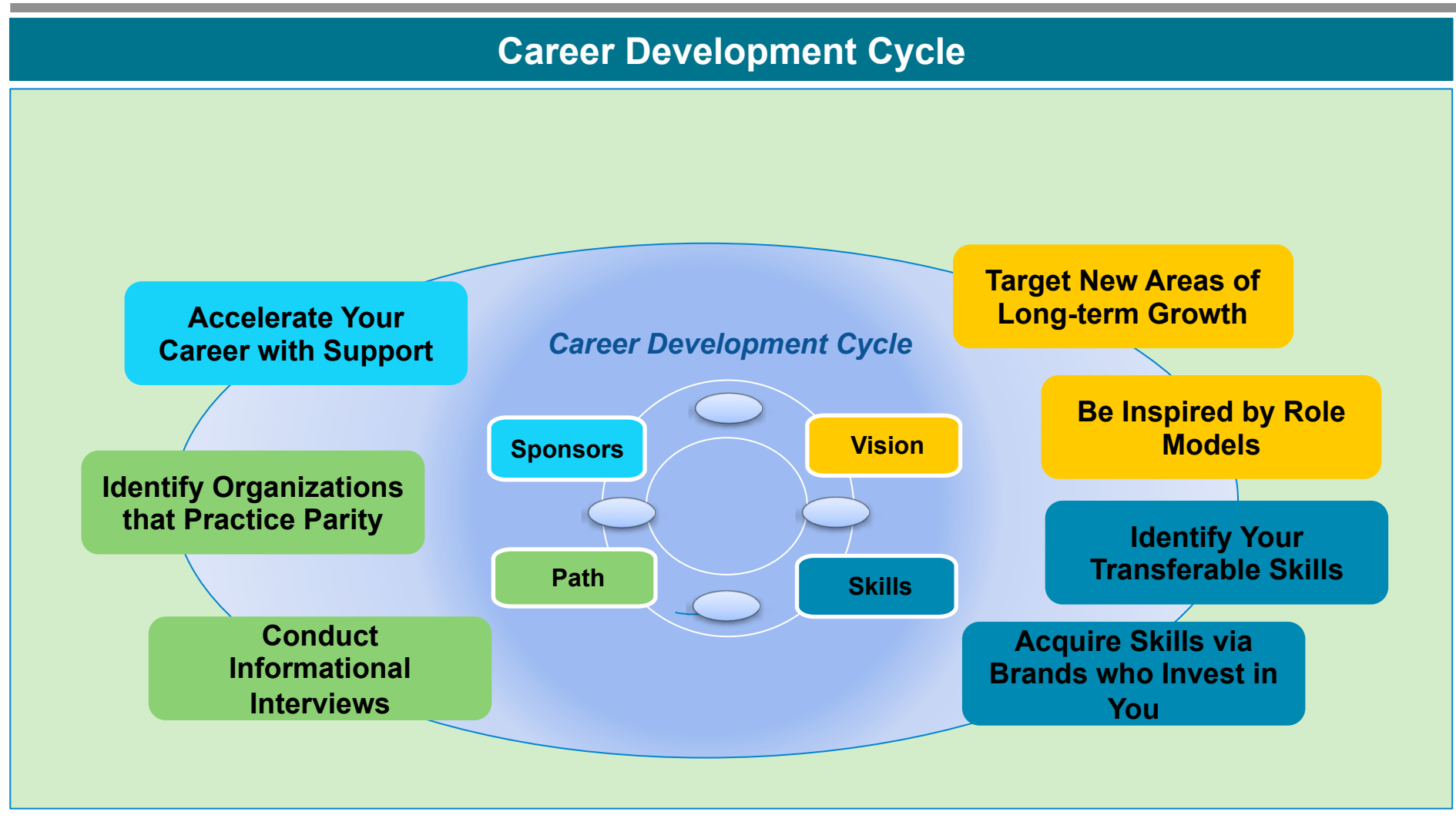


# A way to think about your career

## Career Development Cycle



# Some specifics that have worked for me



**Vision**

# The market of 'clean energy' is wide and deep!

## China Greentech Market Map, 2008-14

		Energy Supply			Resource Use			Other Activities		
Sectors	Segments	Cleaner Conventional Energy	Renewable Energy	Electric Power Infrastructure	Green Building	Cleaner Transportation	Cleaner Industry	Clean Water	Waste management	Sustainable forestry and agriculture
				Cleaner coal	Solar energy	Transmission	Optimized design	Cleaner road	Optimized design	Water extraction
		Cleaner oil	Wind power	Distribution	Sustainable materials	Cleaner rail	Sustainable materials	Water treatment	Waste recycling	Sustainable land man.
		Cleaner gas	Bioenergy	Energy storage	Energy efficiency	Cleaner air	Efficient processing	Water distribution	Energy recovery	Sustainable communities
		Nuclear power	Hydropower	Demand management	Water efficiency	Cleaner waterway		Water use	Waste treatment	Optimized crops
			Wave power	Supply flexibility				Wastewater treatment	Sustainable disposal	
			Geothermal energy							

**Vision**

# The market is aggregating around five major ecosystems

## Ecosystems of Integrated Solutions

### Energy Value Chains



Provides cross-industry perspectives on how to achieve China's energy goals; emphasizes downstream energy savings through demand-oriented, integrated solutions

### Sustainable Industry



Advocates scaling industrial activities in economically, socially and environmentally sustainable ways to reduce energy usage as well as air, water and other forms of pollution

### Built Environment



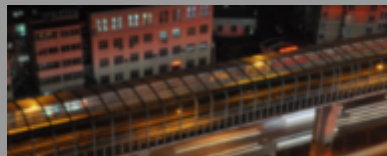
Promotes integrated solutions throughout building life cycle, which produce measurable results and replicable models for different building types and locations

### Cleaner Vehicles



Focuses on solutions that increase energy efficiency, reduce emissions and improve resource utilization to minimize the environmental impact of high speed road vehicles

### Eco-Cities and Developments



Describes a development concept encompassing emission reduction, environmental protection and economic and social sustainability. At its core is effective coordination at every stage of city propositioning, urban planning, construction and management.

## At 2.7M jobs, US Advanced Energy is a major employer as well as a \$200 billion market force

### US Advanced Energy Market by Industry, 2016

- **Global advanced energy: \$1.4 trillion** industry, as big as fashion, twice the size of airlines, and nearly equal to worldwide spending on media. Equal to Mexico's GDP.
- **US advanced energy: \$200 billion** market, nearly double the revenue from beer sales, more than pharmaceutical manufacturing, and approaching wholesale consumer electronics.
- **Building Efficiency:** Largest advanced energy market segment, with **\$63.6 billion in revenue** and 50% growth over 2011, counting only products for which AEE has five years of data.
- **Solar:** Dynamic growth story in the US. Even as costs have declined by nearly 50%, revenue from Solar PV reached **\$22.6 billion**, up 21% over last year and nearly triple 2011 revenue.
- **Wind:** Grew strongly for the second year in a row, continuing to climb back from a low point in 2013 to reach **\$14.4 billion** in 2015, up 75% over last year.
- **Energy Storage:** At **\$743 million revenue**, grew 12 times over 2014. This game-changing technology can provide grid support services, meet peak demand needs, and store variable renewable energy generation until it's needed.
- **Ethanol:** Revenue declined by a third over last year, as the price in U.S. tends to follow the price of gasoline. Historically low oil prices brought Ethanol revenue down.
- **Plug-in Electric Vehicles:** 2015 revenue **grew seven times over 2011**. At nearly \$5 billion, revenue from PEVs in 2015 was nearly half of hybrids, a more established class of adv. vehicles.

## To stay abreast of market growth trends and companies, follow Bloomberg New Energy Finance

### Global Trends in Clean Energy Investment, Jan. 2017

- **New investment** in clean energy fell to **\$287.5bn in 2016**, 18% lower than the record investment of \$348.5bn in 2015
- The 2016 setback in global investment partly reflected sharp falls in equipment prices, particularly in solar photovoltaics
- There was a marked cooling in two key markets, China and Japan. China and Japan are cutting back on building new large-scale projects and shifting towards digesting the capacity they have already put in place
- Offshore wind was the brightest spot in 2016. Capital spending commitments hit \$29.9bn in 2016, up 40% on the previous year, as developers in Europe and China took advantage of bigger turbines and improved economics
- **Acquisition activity** in clean energy totaled **\$117.5bn in 2016**, up from \$97bn in 2015 and the first time this has broken the \$100bn level. Behind this surge were a rise in **renewable energy project acquisitions** to **\$72.7bn**, but particularly a leap in **corporate M&A** to a **record \$33bn**

**Vision**

# Selected Greentech Capital Advisors' M&A Transactions



MITSUI & CO.

Exclusive financial advisor on its acquisition of the commercial and industrial solar operations of



January 2017



Undisclosed



Generation reine Energie

Exclusive financial advisor on its combination with



January 2017



Undisclosed



renewable choice ENERGY

Exclusive financial advisor on its sale to



January 2017



Undisclosed



Scatec Solar

Exclusive financial advisor on the sale of the 80 MW Utah Red Hills solar power plant to



December 2016



Undisclosed



Exclusive financial advisor on its acquisition of the French business of



November 2016



Undisclosed



Exclusive financial advisor to KK Group on its sale to



November 2016



Undisclosed



Exclusive financial advisor on its investment in



October 2016



Undisclosed



Exclusive financial advisor on the sale of its utility customer engagement business to



August 2016



Undisclosed



A Strategic Asset Management Company

Exclusive financial advisor on its follow-on investment in its joint venture with



August 2016



\$66,000,000



powering change®

Exclusive financial advisor on the sale of a 102 MW solar project in Texas to



June 2016



Undisclosed



JAPAN WIND DEVELOPMENT CO., LTD.

Financial advisor to Bain Capital and Japan Wind Development on the sale of a 206 MW wind portfolio in Japan

June 2016



Undisclosed



Forever Forward

Exclusive financial advisor on the sale of its solar PV inverter business to



June 2016



Undisclosed



**Vision**

# Identify female role models who inspire you

## Women Leaders in Clean Energy



### Energy Value Chains

- ZHANG Hangbing, Canadian Solar
- Helen Zhang, Hanergy

### Sustainable Industry

- ZHANG Huaying, Coca-Cola
- Susan Sotiropoulos, DuPont
- Jennifer Holmgren, Lanzatech

### Built Environment

- QING Ye, Shenzhen Low-Carbon City
- Kate Dunham, ARUP / Columbia U.
- Carol Ross Barney, Chicago Riverwalk

### Cleaner Vehicles

- Mary Bara, GM
- Holly Lei, Bayer

**IT** ▪ Ginni Rometty, IBM

**Media** • Rebecca Blumenstein, WSJ

**Advisory Services, Media** • WANG Tao, UBS  
• Nora Wu, PwC  
• Elaine Wong, Hao Capital

**Univ., Govt., NGOs** ▪ Dava Newman, MIT/NASA  
▪ Beate Grzeski, German Embassy  
▪ Barbara Finamore, NRDC  
▪ Erica Thomas, US Dept. of State

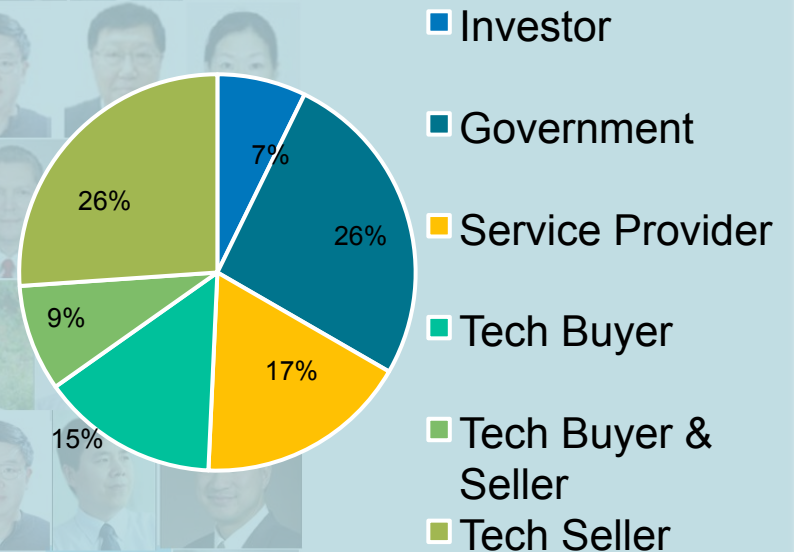
Skills

# All skills are needed!

## Selected Faces of the China Greentech Initiative Community



### Organizations Participating in Spring 2013 Greentech Council



## Skill acquisition with trusted brand names is the single most important priority of your early and entire career

### *Identify your Transferable Skills*

**Questions:** What skills, with people, data and things, come naturally? What can you do and love to do?

**Resource:** *What Color is Your Parachute?*, by Richard N. Bolles; updated annually since 1970

### *Acquire Skills via Employers Known for your Desired Skills*

**Questions:** Which org's or persons have best credentials in your skill areas? Which org's invest in developing their talent, i.e., via management rotations, formal training, reimbursement for courses?

**Resources:** Research online to learn about job specs, description, career trajectory and compensation

### *Skill Builders (in parallel with on-the-job-training)*

**Reminder:** Your skills are transferable! Don't assume you need further schooling until you've completed Chapter 7 of *What Color is Your Parachute?*

**Resources:** Online short courses, tutorials, internships, certifications

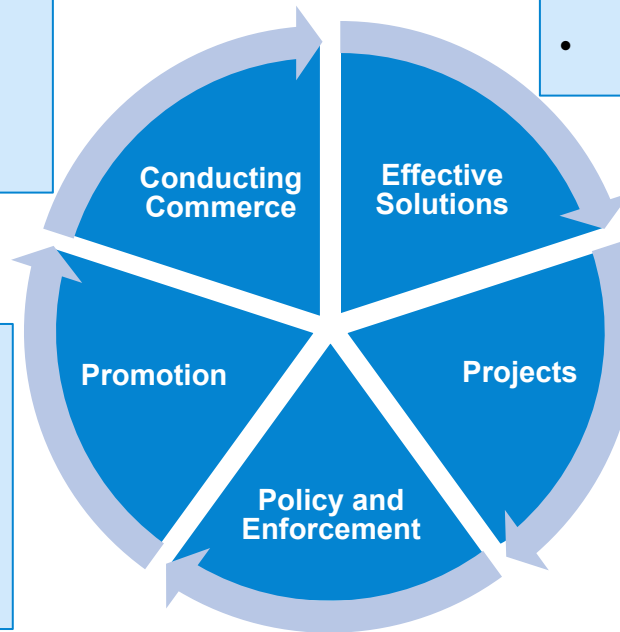
**Skills**

# What comes naturally to you?

- Sales
- Business administration
- Business management
- Consulting
- Investing / finance
- Legal

- Science, R&D
- Engineering
- Product design
- Solution development
- Testing and certification
- Quality control
- Licensing

- Public relations
- Media
- Communications
- Marketing



- Investing / finance
- Design, architect, plan
- Engineering & integration
- Project management

- Policy development
- Policy influence
- Policy enforcement

Skills

Areas of Application

## Once you know what you want, conduct informational interviews to find out which careers match you

### Informational Interviewing, 5 Steps

#### 1. Careers Best Matched to You

- Find out the name of careers that match you. To what careers or jobs does your “flower” point (six pedal self-analysis)?

#### 2. Try It On before you decide

- Try on careers before you decide which ones to pursue (before education, job-hunting, etc.). Talk to people who are doing the job you are thinking about.

#### 3. Types of Org’s with These Jobs

- Find out what “kinds of places” where you might get hired; make sure you are casting the widest net possible.

#### 4. Names of Places of Interest

- Ask which particular places do the kind of work in which you are interested.

#### 5. Learn Before You Enter the Door

- Demonstrate you love them and have taken the time to learn all about them before you walk in the door for a formal interview.



**Path**

The possibilities among organizations is limitless, be it business, advisory firms, academia, media, govt or NGOs

**CGTI's Community, 2008-14**

**Companies**

**Governmental and Non-Governmental Organizations**

## Which companies meet best practices of 2<sup>nd</sup> annual *Women in the Workplace Report* by McKinsey and LeanIn.Org?

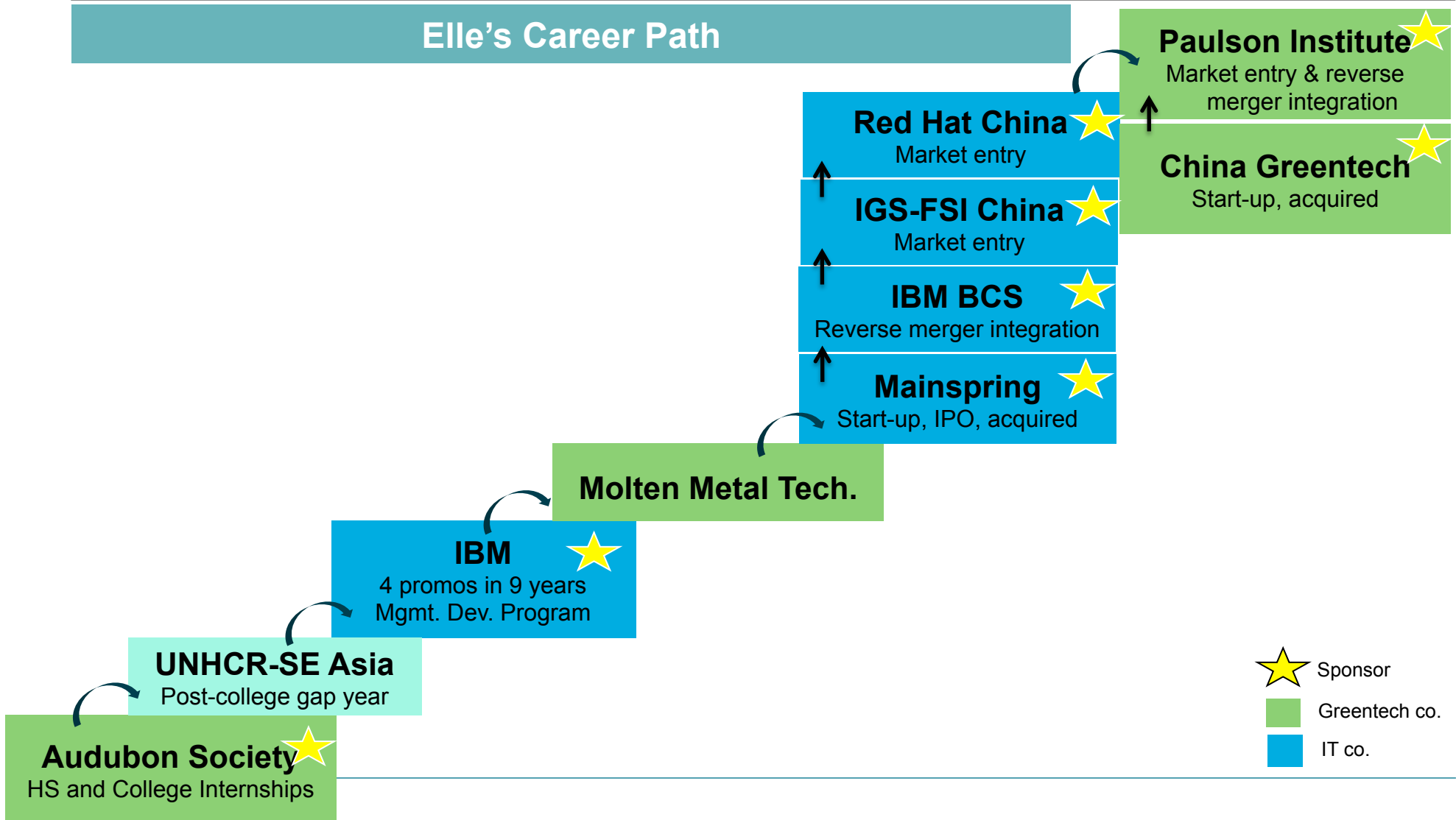
### Best Practices from 2016 Report

- **Women Are Leaning In** – But they face pushback
- **When More Women Hold Power** – Impact is felt throughout companies
- **Borrowing an NFL Strategy** – Tech firms cast a wider net in hiring
- **High Finance and Family-Friendly** – KKR adopts a slew of benefits
- **Time for a new Gender-Equality Playbook** – Dominic Barton’s plan of action
- **Prep for Your Parental Leave** – Coaching helps with the transition
- **Diversity Efforts, Without Fear** – Avoiding minefields for white men
- **Millennial Women Find Familiar Obstacles** – Many look outside corporations
- **Making Pay Equity a Reality** – Formal policies are just a start
- **The Case for Day Care at Work** – Centers can be costly but beneficial

Sponsors

**Sponsors accelerated my career; vision, skills, being coachable and fluid in course corrections contributed, too!**

### Elle's Career Path





# Best wishes on continued success in developing your career!

## Career Development Cycle

